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## ORIGINAL COMMUNICATIONS.

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### MODERN METHODS OF ACCESSORY SINUS TREATMENT.\*

BY H. HOLBROOK CURTIS, M.D., NEW YORK.

The accessory sinuses of the nose have either suddenly been deemed worthy of consideration by the medical world, or else the infectious bacilli which have caused so many recurrences of the influenza of late years, have produced a new condition of affairs in the adjacent sinuses which has modified previously existing nasal conditions. Whether it has been the result of an evolution of new microorganisms or a specialization of known species, the fact remains that the nose has to be looked at from a different point of view than in the past.

Fetid catarrh of the early part of the past century was undoubtedly chronic antrum or sinus disease, in which the poor victim suffered from the ignorance of the surgeon. As specialists today we all come in contact with an endless chain of so-called supra-orbital neuralgias and tic douloureux, treated as such by eminent general practitioners, which are in reality sinus cases. These only fall into our hands by some happy accident, or because of an intolerable state of suffering which suggested the specialist. It does not seem out of place to attempt to enlighten the medical public on this subject, and too much space cannot be employed in elaborating the etiology and pathology of accessory sinus disease.

My province tonight, however, is limited to a review of the recent methods of treatment. First I will consider the type of cases of acute frontal sinus empyema as they have occurred in New York

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this winter. The onset has been as follows: Usually the disease is accompanied by the symptoms of an acute coryza with muco-purulent discharge and intense pain over one or both eyes; this is intensified by stooping forward, straining at stool, coughing, or by any sudden movement; the pain is not continuous, and is apt to cease at bedtime, to begin on awakening with increased intensity; unless relieved by frequent hot douches and hot applications over the forehead, the pain becomes intolerable. The use of the eyes for reading aggravates the symptoms. Morphine and phenacetin is the routine treatment of the general practitioner. We as specialists usually see the case in consultation on the seventh day. The patient is found nervously prostrated by suffering and drugs, and quite willing to undergo any operation for relief. Twelve cases which have come to me in this condition since January 1st of this year have been treated as follows: Cocaine and adrenalin was applied for twelve minutes to the middle turbinate and roof of the meatus. The anterior portion of the body is next removed by two or three transverse bites of a straight Grünwald forceps. This exposes the ethmoid cells between the internal lamella of the ethmoid and the orbital plate. The forceps is then directed one centimeter below an imaginary line drawn between the inner canthus of both eyes, and the cell structures are broken down antero-posteriorly. A blunt barrel burr drill run by an electric motor completes the removal of these cells. It is very easy while operating to feel the greater resistance of the lacrymal bone and the orbital plate of the frontal. While on the skull it always looks like a difficult matter, this procedure in the living subject is usually attended by no difficulty whatever. After the removal of the tip of the turbinate, we often find the cells so easy of penetration that the forceps and drill need not be employed. The end of a German silver Eustachian catheter moved backward and forward will often be sufficient to break down these delicate structures. Any stiff tool with a blunt end may be used. It is carried upward and backward on a plane parallel with the septum of the nose, always remembering to keep outside of the internal lamella, hugging the orbital wall and thus avoiding the cribriform plate. In using the barrel burr drill in older persons, whose cell walls are harder, we must take the precaution to cut in a forward direction using the fore finger on the upper lip as a fulcrum and inclining the drill as a radius more toward the perpendicular anteriorly as we break down the cells.

In every case operated on, it was easy to feel the moment I entered the fronta-nasal duct, a fact which it is well to verify by introducing the catheter and syringing the cavity of the sinus. The

patient is always able to tell whether the hot boric acid solution enters the frontal sinus. He generally speaks of feeling it back of the eye and in his forehead.

I do not wish to be understood for a moment as advocating this method in the treatment of chronic cases. The occasional employment of it, however, during the past twelve years, and the constant use of it the last three has led me to endorse it as the best means of affording very speedy relief to the distressing acute condition. On the second or third day all pain generally ceases and a week usually effects a cure of the disease, pain and discharge having ceased. Two things are accomplished besides this, viz., intranasal pressure is relieved, and the probability of recurrence of the malady is lessened.

This operation is advised, it is needless to say, only in those acute cases in which douching after contracting the tissues with cocaine, menthal, and adrenalin applications, does not afford relief by facilitating discharges, or in those cases which have not resolved spontaneously.

The chronic frontal sinus empyemas must next be considered. The choice of operation depends, not on the conditions of the sinus, but upon the condition of the adjoining ethmoid cells. If the posterior cells are affected, let us consider a Killian, or an operation under the orbital ridge. If we think that the posterior cells are not affected, let us seek to obliterate the sinus without disturbing the continuity of these cells. The choice of operation should be deferred, if possible, until the floor of the cavity is observed and we are enabled to ascertain whether there is an excursion of the sinus and possibly of the posterior cells over the orbital roof. In the latter case it is unwise to try to obliterate the sinus, and we do well to do a Killian operation, or extend our bone opening as far as the nasofrontal suture, in order to be able to get a more horizontal plane for operating upon the posterior cells. The one condition which would contraindicate this procedure would be the simultaneous involvement of the maxillary antrum and sphenoid sinus, in which case it would be perhaps better to do a more radical operation through the antrum for the relief of the latter conditions. The operation of Killian is commended in that the supraorbital ridge is left as a bridge to prevent deformity, permitting a free opening above and below for the free curettage of the sinus and also for the breaking down of the middle and posterior ethmoid cells.

In this country, where cosmetic results must be considered to an even greater extent than abroad, this operation must appeal to the surgeon. If we could save in this method the pulley of the superior

oblique muscle, it certainly would be a marked advance in the way of dealing with frontal sinus disease. In this operation, the frontal is beveled down by the chisel so that the skin flap comes in contact with the posterior wall of the sinus as much as possible, a procedure which promotes the formation of granulation tissue beneath the ridge. The wound is then sutured at once and the very free opening into the nose is utilized for drainage. This is a decided advance upon the operation which removes the entire wall, and it prevents the flat face which gives such a disagreeable expression to the patient.

In those cases in which we are reasonably certain that the posterior cells are not involved, the operation for the obliteration of the sinus by making an entrance above the ridge is to be strongly recommended. We have done this in five cases with excellent results. The sinus is opened, very carefully curetted, and packed with iodoform wool. The after-treatment being the same as in a mastoid operation. As the granulations appear and the sinus fills up, the flaps which have been sutured at either end of the incision are brought together until, at the end, we pack through an orifice the size of a slate pencil. If the eschar is uneven, we may pare the edges and bring the skin together in such a way that the cicatrix is not objectionable. In doing this operation, we make quite as large an opening through the floor of the sinus as if we were expecting to drain through this channel. The packing will induce a healthier foundation of new granulation tissue to form as a base, than if possibly unhealthy cells were left for a floor. In one case which I have reported, however, a mucous membrane by preference seemed to cover the sinus and I closed the external wound without waiting for the process of obliteration. Here the fact that I had made a free opening to the nose was not regretted. Drainage into the nose by means of any tube or gauze drain in any operation on the frontal sinus is unnecessary, for the reason that, if we have a large enough orifice for a drain, we have ample space to irrigate the sinus by normal salt solution, and the drain will only cause irritation and stoppage of the nostril, preventing aeration of the sinus, and possibly occasion much discomfort to the patient.

When a sphenoidal complication exists coincident with the frontal sinus trouble, Killian's operation or an operation under the ridge is indicated. When a sphenoidal empyema exists together with antrum and ethmoidal trouble, the route to the sphenoid sinus should be through the canine fossa, antrum, inner wall of the same in the region of the ostium maxillare, middle meatus, posterior ethmoid cells, sphenoid-ethmoidal recess, and anterior wall of sphenoid in the region of the ostium.



When only a sphenoid sinus empyema exists, without frontal or maxillary complications, the sinus should be entered by its anterior wall, from the largest nasal chamber. This procedure should only be resorted to after attempting to sound and catheterize the sinus through the natural orifices. As a preliminary to this operation, the middle turbinate should be removed, which procedure generally permits a good view of the anterior wall of the sinus and the ostium of that side. A thorough breaking down of the anterior wall will usually relieve the empyema without the necessity of packing. Curettage of the sinus walls should, however, be done as thoroughly as is possible in this disadvantageous locality. The many excursions of the sphenoid sinus must be remembered as well as the possibility of a posterior ethmoid cell having insinuated itself between the sinus and its superior wall. The septum of the sinus also is subject to great variation in its position making the two sides of very unequal size and shape.

Jansen, of Berlin, has developed the surgery of the sphenoidal sinus operation through the antrum in a remarkable manner; but there always is a question in my mind as to whether the dryness of the nasal cavity which is an almost invariable result of this radical operation, is not quite as disagreeable a consequence as the ethmoidal empyema which the operation seeks to obviate. If the choice were presented to me, I think I would prefer an antrum and sphenoid operation done at different times, and ask the surgeon to kindly leave me a few ethmoid cells and a turbinate or two as a souvenir of nasal function. The surgery of the antrum, has been as unsatisfactory as that of the frontal sinus as regards the variety of results which have been obtained by different operators. It would seem that even today we are not in a position to say exactly what we consider the best method of operating, for every case demands a special treatment. A paper which was quite exhaustive upon the subject, read by me before the American Laryngological, Rhinological and Otological Society last May and published in the October LARYNGOSCOPE, rather endorsed the Cauldwell-Luc operation. Since then, however, on account of objection to the canine fossa procedure, I have operated on three chronic antrum cases by removal of the entire inferior meatal wall with the exception of the most anterior portion. This was anticipated in two of the cases by the complete removal of the inferior turbinate, and in the other by turning it up by an Adams forceps into the fossa and afterwards replacing the bone which was not large enough to interfere with syringing but obscured the field of operation.

The more frequently I do this operation and find how readily the antrum may be curetted and packed, the more I am inclined to favor it. For packing it is essential to use zephyr wool, which has proved invaluable in mastoid and sinus dressings and may be inserted through very small openings. It is an excellent dressing to stimulate sluggish granulations and in attempted obliteration of the frontal sinus it proves most satisfactory. Since first advocating this method of treating the frontal sinus by obliterating the cavity I have succeeded in seven cases without a failure.

The canine fossa operation is so liable to reinfection, that it is only to be thought of in cases where necrosis has taken place in the antral walls and where free curetting is essential. This procedure in many cases has eventually to be followed by a Caldwell-Luc operation.

If we are sure that there is no bone implication, it is always best to first do an inferior meatus operation in the way already described; and I am not sure but that it is always the most judicious procedure. If by the use of silver preparations or the zinc salts, we are not able to cleanse the cavity and pack it satisfactorily to produce granulation tissue metamorphosis, we are always in a position to do a canine-fossa operation afterwards. Having an orifice for drainage and dressing already established in the nose, we may immediately close the new buccal incision. By employing this method, I have removed obturators which have been worn for years in the canine fossa or through a tooth socket, and even when the antrum trouble has not been entirely cured, the relief to the patient of dispensing with the plug in the mouth was enormous.

Syringing the antrum daily through the nose is a luxury compared with the annoyance of removing a mouth tube and introducing a canula.

118 Madison Avenue.

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**The Temperature of the External Auditory Canal—ERNST SOMMER—*Berl. klin. Wchnschr.*, Sept. 26, 1904.**

The temperature of the external auditory canal averages about 36.5° C. (97.7° F.) It varies in different parts of the day, and is higher on the left side, corresponding to the greater vascularity of the left side of the head.

YANKAUER.

## THE ANTRUM OF HIGHMORE; THE REMOVAL OF THE GREATER PART OF ITS INNER WALL THROUGH THE NOSTRIL, FOR EMPYEMA.

BY DR. OTTO T. FREER, CHICAGO.

Drainage of the antrum of Highmore through its inner wall was first proposed by Mikulicz in 1887. (*Langenbeck's Archiv*, Vol. 34, page 626.) He made an insufficient opening underneath the lower turbinated body without resecting it, so that his method was not effective and did not come into general use.

H. Holbrook Curtis in October, 1903 (*THE LARYNGOSCOPE*, Vol. XIII, page 737, October, 1903), describes an operation which he calls the radical operation through the inferior meatus, in which he resects the anterior third of the inferior turbinated body and makes an opening in the lower part of the inner wall of the antrum with the trephine, enlarging it with a burr. This method of Curtis suggested to me the operation I describe, and I have followed the main features of his technique; but I have resected the anterior two-thirds of the inferior turbinated body instead of only its anterior third, and I was not satisfied with the size of opening in the inner wall of the antrum shown in Curtis' illustration, but removed nearly all of the anterior two-thirds of the inner wall of the antrum in my case. Curtis does not add case reports to his article, but Claoué (*Revue Hebd. de Laryngologie, D'Otologie et de Rhinologie*, 1903) mentions 12 cases of chronic maxillary sinusitis in which he cut away the lower part of the inner wall of the antrum through the nostril after resection of the anterior two-thirds of the inferior turbinated body. I have not had access to his complete article; but in the report of the meeting where he read his paper, it is stated that he operated under cocaine anaesthesia and trephined by hand. Nine of his 12 cases were cured. Escat at the same meeting described seven cases, all cured by him by Claoué's method of operation. Claoué thinks that the importance of curettage is overestimated and that a free opening into the antrum admitting the air and preventing stagnation will in all cases, but those with exuberant fungosities, suffice for a cure, if lavage be kept up for a time.

The removal of the greater part of the inner wall of the antrum through the nostril is an operation which I think will largely take the place of the two standard proceedings most employed at present, alveolar drainage into the mouth, and the radical or Caldwell-Luc

operation and its modifications; for there is a demand for an operation not as severe as the radical one, but one which will relieve the many patients with chronic suppuration of the maxillary sinus who are tired of irrigating their antra through alveolar tubes for months and years, and who wish to be rid of the depressing feeling of unsoundness caused by the slight but constant, more or less foul discharge, which oozes through the alveolar opening into the mouth and reminds them of their hidden disease. In addition, the imperfect drainage through an alveolar outlet keeps up an irritation of the lining of the antrum of Highmore which extends to the region of the infundibulum and leads to a chronic hypertrophic inflammation of the lateral fold and middle turbinal, obstructing the nostril, whose entire mucous lining is often intumescent in sympathy. Chronic purulent rhinitis also often exists as a complication. Even where drainage into the mouth causes but a minimum of these troubles, many of the patients finally become hypochondriacs and wish to be rid of their disease. Nevertheless, the radical Caldwell-Luc operation seems so out of proportion to the slight symptoms caused by the antrum suppuration in many cases, that it does not seem justifiable in such instances to insist on this rather formidable procedure; though the much less severe intranasal operation could be freely advised, especially since its results so far show that it promises a probable cure and at the least a much more tolerable condition to the patient, for even if the discharges do not cease it is at least blown out in the normal way through the nose instead of leaking into the mouth. A further argument in favor of the intranasal operation is, that should the radical one become necessary after all, the intranasal one is but one of its steps.

There will always be empyemas of the antrum that demand the radical Caldwell-Luc operation, but I think that it will be restricted to the worst cases, such as are complicated with phlegmons of the orbit or of the sphenomaxillary fossa, or where there is caries of the bone, or where the sinus is multilocular or contains cysts. The radical operation will also be the best where coincident suppuration of the ethmoidal cells and sphenoidal sinus make the method so well described by T. Passmore Berens (*THE LARYNGOSCOPE*, Vol. xiv, page 868, November, 1904) advisable, in order that these cavities may be reached through the antrum. For the majority of the cases of empyema of the antrum, even where its diseased mucosa needs removal, I think that the intranasal operation will suffice. It is a method, however, only possible to an operator familiar with rhinological methods and is not for the general surgeon.

The following is the history of my patient. She is a woman of 30 and was well until the summer of 1903, when she had a severe attack of neuralgia in the right side of the face and in the right upper jaw. There was a feeling as if all of the teeth in it were loose, and chewing was so painful that she could not use the right side of her mouth. This neuralgic pain lasted a month or two and gradually subsided, so that she felt well again until February, 1904, when she suddenly became ill with severe frontal headache, pain in the bones of the face on the right side, swelling of the cheek and fever. Her temperature remained at  $102^{\circ}$  to  $103^{\circ}$  for several days, and she had to stay in bed for three weeks. A few days after the commencement of the fever, pus began to run from the right naris and the pain lessened at once. The pus discharged in large amounts for about three weeks, and then less freely, but in constant quantity until the time of operation, large, foul-smelling clots forming, which she had to blow from the nose. When examined on December 14th, 1904, she stated that stooping caused headache in the frontal region, and that when she lay down the pus would run back into her throat, its putrid taste sickening her. She used two or three handkerchiefs daily to catch the discharge. The patient has lost no teeth and has had no dental trouble for several years.

Examination anteriorly showed pus in the middle meatus and edematous swelling of the right middle turbinate, so that it crowded against the septum. Posterior rhinoscopy found normal conditions except some pus in the middle meatus. On transillumination, the frontal sinuses illuminated, but the right one not so well as the left. Its limits were plainly definable, however. Transillumination of the maxillary antra showed darkness of the upper part of the right cheek, and the right pupil remained dark while the left one glowed. A Myles trocar was passed under the right lower turbinal and punctured the inner wall of the antrum under forcible pressure. Washing through the canula forced a great quantity of cheesy, fetid pus through the normal opening of the antrum.

The teeth under the affected antrum were normal, except the first bicuspid, which was discolored and contained a large silver filling, but showed no evidence of decay.

Operation.—The operation was performed on December 18th, 1904. Powdered cocain was applied to the region of the inferior meatus and inferior turbinate, and these parts were made bloodless with adrenalin. The right inferior turbinate was cut off along the anterior two-thirds of its attachment, with Grünwald's scissors, and the flap severed posteriorly with a small knife with angular attach-

ment of its blade. In doing so a strip of the free border of the mucosa-periosteum was overlooked and remained lying unnoticed upon the nasal floor. During the healing process this strip hypertrophied, as will be mentioned later. The resection of the turbinate caused no bleeding, so that the nasal surface of the inner wall of the antrum became plainly visible. The trephine, attached to the cable of the electric engine, was next introduced, its cutting edge being applied as far forward as possible against the outer wall of the nasal cavity in the inferior meatus. In order to accomplish this, the shank of the trephine had to be pressed firmly against the septum cutaneum, displacing the nasal tip strongly to the left. The instrument readily cut through the bone, but with an unmistakable sense of its penetration into a hollow space, so that the operator was in no danger of perforating the outer or posterior wall of the antrum under the impression that he had not yet entered the sinus. A second and third core was drilled out, and then nearly all of the anterior two-thirds of the inner wall of the antrum was cut away with the long barrel-shaped burr, followed by Rhodes' tonsil punch forceps



Seth Scott Bishop's Trephine.

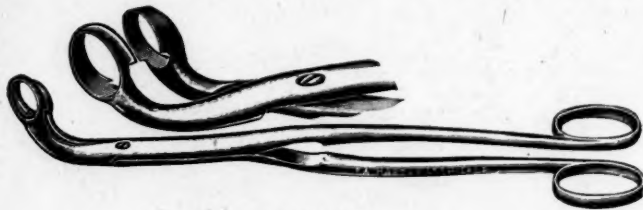
to trim off portions of bone not easy to reach with the burr. The window made extended from a vertical line about  $\frac{5}{8}$  of an inch behind the apertura pyriformis in front to about as far back as the perpendicular plate of the palate bone behind. Below, the bone was cut away with the burr, to the level of the nasal floor. Above, the window reached to the level of the body of the ethmoid bone, a little above the lower border of the middle turbinated body. The little finger was introduced into the nostril from time to time to determine by palpation where the bone needed further removal. When the ridge of the bone that separated the floor of the nasal cavity from that of the antrum had been cut away, thick fetid pus and fibrinous masses flowed out freely, and the interior of the antrum, except its anterior wall, could be inspected, as there was almost no bleeding. The large Rhodes' tonsil punch forceps was passed into the antral cavity, moved about and opened and shut, so that if polypi and fungous excrescences had been present they could have been cleanly cut away with it; the mucous membrane was smooth, however, and grayish white in appearance, being covered with thickened epithelium.



After removal of the bony part of the wall, the mucous membrane which had covered it hung down from above like a curtain and was trimmed off with Rhodes' forceps. The cavity of the antrum and the nasal fossa were then firmly packed with a strip of lint impregnated with powdered subnitrate of bismuth. The patient stated that the pain of the operation was slight and that the most disagreeable thing was the sound of the burr. Had it been necessary, the cavity could have been curetted through the naris, and with the aid of sight, except far in front.

The patient's highest temperature after the operation was  $100\ 1\text{-}5^{\circ}$  F. on the first night after the operation. The packing was removed on the second day and the patient taught to wash out the antrum with normal salt solution. She has never had difficulty in finding the opening since.

At the present date, January 23, the size of the window as measured is nearly as large as at the time of operation, though a



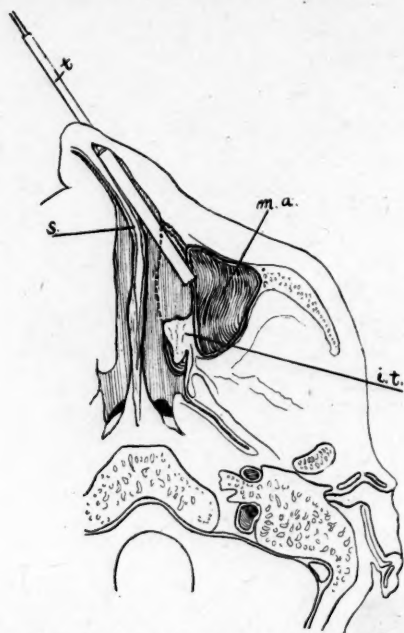
Rhodes' Punch Forceps.

month has elapsed and provisional callus has formed on the wounded bone. The strip of mucosa-periosteum from the lower turbinate alluded to has, however, proliferated to such an extent that it has nearly reproduced the form of the original turbinated body, and therefore hides the view into the antrum obtainable at the time of operation. As the patient suffers no inconvenience from this outgrowth, and it in a measure replaces a physiological structure, I do not feel justified in removing it merely for the purpose of demonstrating the view into the interior of the antrum. There is no discharge whatever from the antral cavity at present, and I regard my patient as recovered.

The success of the operation of the intranasal removal of the greater part of the internal wall of the maxillary antrum depends, as emphasized by Claoué, on making a window so large that all parts of the antrum become accessible and that the aperture will

stay open. Similar procedures in the past were failures because an insufficient opening became closed by granulations and polypoid masses which grew exuberantly because of the irritation due to the insufficient drainage.

The only dangerous region encountered in the operation is the posterior wall of the antrum and the hindmost part of its inner wall. Behind the posterior wall lies the internal maxillary artery, with the sphenopalatine artery, the arteria nasalis posterior and



Horizontal section of head at the level of the attachment of the inferior turbinate showing trephine applied to internal wall of the antrum. m. a. Maxillary antrum. i. t. Posterior third of resected inferior turbinate; the dotted line shows extent of turbinate before resection. t. Trephine. s. Septum bent over to the left by the shank of the trephine.

arteria palatina descendens branching from it. A number of cadaver operations showed me that this wall could only be injured, should the trephine plunge through too far, if the instrument were directed backward in a line at an angle with the septum of about 20 degrees. The proper angle is, as Curtis states, about 45 degrees, that is, the trephine should be made to lie as nearly across the naris as possible by forcing over the septum mobile. Trephines or burrs on curved shanks I did not find necessary.

The opening should not extend backwards beyond the posterior third of the lower turbinate, and one should not attempt to be too radical and cut away portions of the perpendicular plate of the palate bone lest one should possibly injure the arteria palatina descendens, or by advancing high up, the spheno-palatine artery or its branches. Berens mentions arterial hemorrhage from this latter region in one of his operations by the radical method.

The burr I employed is barrel-shaped, like that of Curtis, but I had it made longer,  $2\frac{1}{2}$  centimeters in length, so that it should not slip off from the edge of the bone when cutting. Its diameter is 4 millimeters, it has saw teeth and a smooth, blunt end. Palpation was a most useful guide in doing the operation, and Rhodes' punch forceps proved better than the smaller kinds, adapting itself perfectly to the work.



Freer's Long Antrum Burr.

As more of these operations are done, unfavorable cases will be encountered, but my impression is that in the greater number of chronic empyemas of the antrum it will be found a feasible and successful, but sometimes doubtless, a difficult operation.

Note.—Since the above was written an article by L. Réthi (Wiener Klinische Wochenschrift, 1904, No. 34) has come to the author's notice. Réthi, after removing the anterior two-thirds of the inferior turbinate, resects the nasal wall of the antrum in the middle and inferior meatuses, that is to the extent described in this paper. He regards Claoué's opening, which is confined to the inferior meatus, as insufficient. Réthi was the first to describe the operation, in 1901. (Wiener Medicinische Wochenschrift No. 52, 1901.) Of his 15 cases, 12 were cured, 3 relieved.

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**A Case of Otolithiasis**—M. S. SCHIRMUNSKI—*Monatschr. f. Ohrenh.*, Berlin, Aug., 1904.

The canal was filled with hardened masses of epidermis, the center of which was calcified. Chemical examination showed the presence of phosphate and carbonate of lime.

YANKAUER.

## THE PROPER POSITION OF THE PATIENT IN THE OPERATION FOR THE REMOVAL OF ADENOID VEGETATIONS UNDER GENERAL ANÆSTHESIA.

BY C. R. HOLMES, M.D., CINCINNATI, OHIO.

Stenger of Königsberg, in the *Centralblatt für Ohrenheilkunde* for September, 1904, exhaustively reviews the subject of "The use of anæsthetics in the removal of adenoid vegetations from the nasopharynx." He covers the literature of the past thirty-one years, and quotes from the written opinions of fifty-two operators of Europe, America and Australia. In the course of his descriptions of the methods of anæsthesia and the choice of an anæsthetic of this large number of surgeons he refers to and describes the prevailing German method of operating—the patient "with the body upright, embraced by an assistant, both arms fixed and the head lying against the assistant's shoulder"—and the prevailing English method, with the "hanging head," that is, with the head drawn over the end of the operating table and allowed to hang vertex down, so as to obviate the passage of blood into the larynx and trachea.

Stenger's article recalls to me that I have not heretofore formally reported a method of operating upon adenoid vegetations that I have used with great satisfaction since 1890, and that I consider to have such great advantages over the Continental and the English method, that in no case have I ever used either of those methods since adopting the procedure that I am about to describe.

As a preface, I would remark that my practice with regard to the choice of an anæsthetic accords with what appears to be the consensus of opinion of the vast majority of operators: In children under two years of age, I use no anæsthetic at all, crushing the adenoids with my finger; informing the parents, however, that this may not be sufficient and that it may be necessary at some subsequent time to make the more complete and radical instrumental operation under a general anæsthetic. In children from two to fourteen years of age, I employ chloroform; and in children over fourteen, local anæsthesia by means of cocaine when the self-control of the child will permit.

Of course the above statement must not be taken dogmatically; each case is considered on its merits, and variations in the choice

of an anæsthetic occur as the result of that consideration; but, broadly speaking, these rules are regarded as the safest guide in preparing for an operation. I would also mention another detail that I consider of great importance. I now use exclusively what is known as Merck's "rectified and redistilled chloroform." Formerly, when I did not concern myself to specify this particular preparation, I frequently used Merck's "redistilled chloroform" and the "purified chloroform" of other manufacturing chemists, and I not infrequently encountered alarming symptoms that interfered with the thoroughness of the operation and caused me great anxiety. Since the adoption of this "rectified and redistilled chloroform" as the only chloroform to be allowed in my operating room, my operations have been singularly free from disagreeable and alarming symptoms and my sense of security has been much greater. I wish to put myself on record as unqualifiedly condemning the putting on the market by any manufacturer, foreign or domestic, of an inferior or "second best" grade of anæsthetic. There should be only one grade of chloroform or ether allowed on the market, and that should be the best and purest obtainable by modern methods. The manufacture and sale of anything less than this should be absolutely prohibited.

In proposing a new method of operation, it is not only permissible but obligatory upon the part of the surgeon to point out any faults or danger in the older and customary procedures, which have induced him to seek for an improved and safer measure. Newness which is merely novelty should not and does not appeal to the practical operating surgeon, and a reasonable argument must be given to induce surgeons to abandon methods of operation in use for at least twenty-four years and take up a new one. In the first place, let us examine the German or upright position first described by Hopmann. All systematic writers upon anæsthesia assert and apparently upon perfectly sufficient theoretical and clinical grounds that the upright position is unsafe in chloroform anæsthesia; the heart is sufficiently burdened with this cardiac depressant anæsthetic without compelling it to pump blood against the force of gravity to the vital centres in the medulla. The hemorrhage is often times quite brisk, and though the operation takes but a few minutes, those few minutes are amply sufficient to permit of a copious inspiration of blood into the larynx and trachea, producing alarming immediate symptoms of respiratory embarrassment or cardiac failure and possibly a later inspiration pneumonia. In addition to these or failing these dangers, there is the absolute impossibility of exactly

appreciating the amount of hemorrhage, as a large quantity of blood may find its way down the lateral walls of the pharynx into the oesophagus and stomach. Even if the hemorrhage be not sufficient to be in itself a source of danger, the presence of blood in the stomach will almost invariably produce a post-anæsthetic emesis contributing materially to the discomfort of the patient and the parents; and the resultant muscular spasms and congestion of all the structures of the head will tend to the possibility of a secondary hemorrhage of greater or less extent.

In the second place, considering the operation undertaken with the "hanging head," the body horizontal, the head drawn over the end of the table in a position of extreme hyperextension, or in what is called by some authors a modified Trendelenberg position. There is no objection to be made to this position in respect to the safety of an anæsthetic, but the position is one of extreme awkwardness for the operator and does not by any means entirely fulfill the purpose for which it was designed, namely, the prevention of the entrance of blood into the larynx. Owing to the awkwardness of the position and the extreme congestion of the head, due to the bending of the neck and the stretching of the veins whose lumen is thus materially reduced, the time necessary to perform the operation thoroughly is lengthened, the hemorrhage is necessarily much greater, and, the small nares of the child being speedily choked with blood clot, the naso-pharynx fills rapidly with blood, the post-pharyngeal wall is quickly obscured and blood runs out of the nose and mouth, producing a ghastly picture and obscuring the face and eyes, a field which it is so necessary to watch closely and uninterruptedly during anæsthesia. Where the hemorrhage is at all profuse, the possibility of liquid blood and clots being sucked into the larynx, is not at all out of the question, as the unnatural relations of the chest wall and upper air passages and the venous congestion of the latter and of the brain make respiration labored and interrupted and the inspiratory act when it takes place rapid, deep and violent. All operators know how important it is to have an unobstructed view of the post-pharyngeal wall so as to be able to see and remove all tags that may have been left after the sweep of the curette, as their removal insures the cessation of the immediate hemorrhage which may be dangerously prolonged by their presence, and leaves a smooth, clean surface from which no subsequent infection may be feared.

Let us now see if the obvious disadvantages of both of these positions cannot be avoided by placing the patient in another position that is simple, natural and safe for the patient and convenient



and in every other way satisfactory to the surgeon. For the past fourteen years it has been my practice to proceed as follows: The foot of the operating table is elevated upon blocks eight inches high so that the patient's feet will be slightly but distinctly above the level of the head. The child after a thorough preparation, both for the general anæsthetic, and to secure as thorough asepsis as possible, is brought to the operating room and anæsthetized in the recumbent position. While passing under the influence of the chloroform its scalp is done up firmly in a towel wrung out of an antiseptic solution so that, on the one hand, the hair will not fall over the face or touch the operator's hands, should it be necessary to shift the position of the head, and on the other hand, that it may not be accidentally soiled with blood. When complete anæsthesia is obtained, the chloroform mask is removed and my mouth gag introduced and while the child is still lying upon its back, the hypertrophied faucial tonsils, if they are present, are liberated by a blunt dissector from any adhesions which may bind to the faucial pillars. When this has been thoroughly done, it is usually necessary to give a few whiffs more of the anæsthetic so as to prolong the anæsthesia through the subsequent removal of the adenoids. The child is then quickly turned upon its left side, the left arm and shoulder drawn back so that the former lies on the table behind the child, the right arm is grasped near the shoulder joint by an assistant on the opposite side of the table, who lifts that half of the shoulder girdle away from the chest so as to secure ample breathing space, and at the same time to steady the child, the mouth gag is reintroduced into the right side of the mouth by the principal assistant who manages the gag and slightly extends and steadies the head, the face is brought even with the left edge of the table or even slightly over the edge and the operator, equipped with an electric forehead mirror and seated on a stool of medium height on the left side of the table, removes the adenoid hypertrophy, quickly and thoroughly with the Gottstein curette or some modification of that instrument, and subsequently examines the naso-pharynx with the index finger of the left hand and removes with curved scissors and forceps any shreds or tags of the growth, or of the pharyngeal mucous membrane that may have been stripped up, as may rarely occur. The faucial tonsils are then removed if necessary with the cold snare or, if soft and ragged, with the curette, the adenectomy having been thoroughly done so quickly as to allow an ample margin of time for a double tonsillectomy before the patient emerges from under the influence of the anæsthetic. As soon as the hemorrhage ceases, the patient is rolled over into the supine position, the left cheek cleaned

from the few flecks of blood that are upon it, the towel removed from the head, and he is carried to his bed from which he is released the next day, to remain in his room in the hospital for three or four days. At the end of this time, all danger from a possible secondary hemorrhage is over and a healthy granulating surface has covered the wound and can resist to the utmost any accidental infection that might be encountered in the street or in the home.

By this method of performing the operation it will be observed:

*First.* That the position of the patient adds nothing to the ordinary dangers of the anæsthetic, the force of gravitation does not add to the burden of the heart, the neck is straight, the respiration is not embarrassed by "embracing" the chest or "fixing" the arms or by the pharynx filling with blood which is likely to find its way into the windpipe.

*Second.* That the position of the head is such that all of the hemorrhage finds its way out of the nose or when that becomes blocked by soft clots out of the mouth, the inner surface of the left cheek forming the floor over which it travels to the left angle of the mouth. In this way the field of operation is kept clear so that the operator can at all times see the posterior pharyngeal wall or can easily clear it with a wad of cotton on a sponge holder and can detect and remove any shreds that tend to make the operation imperfect, and

*Third.* The amount of blood lost can be accurately appreciated as it drops into a white stone receiver on the floor between the feet of the operator, and none can find its way into the stomach to deceive the surgeon as to the volume of the hemorrhage and to annoy the patient after recovery from the anæsthetic by producing emesis and possibly a secondary hemorrhage excited by the latter.

I have employed the method described in about 1000 private cases and I have found it so eminently satisfactory in all respects that I would not think for a moment of operating by means of the "up-right" method of Continental surgeons or the "hanging head" of the British and Colonial surgeons. I have had no deaths.

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#### **The Use of Glass Mirrors for Intratympanic Examinations—**

VICTOR URBANTSCHITSCH—*Monatschr. f. Ohrenh.*, Berlin, Aug., 1904.

The author substitutes glass mirrors for the metallic mirrors of Trölsch, and thereby secures a better image.

YANKAUER.

## MIDDLE EAR SUPPURATION AND ITS COMPLICATIONS.\*

BY HUNTER F. TOD, F.R.C.S. LONDON.

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The subject under discussion to-night is such a large one, and the time at my disposal is so short, that I shall only attempt to take you over the main points.

Fifty years ago Wilde said of otorrhoea, that it was impossible to say how, when, or where it might end, or to what it might lead. That statement was made at a time when aural surgery practically consisted in the curetting out of granulations from the middle ear *via* the external meatus, or in the incision of an obvious abscess behind the ear. Since that time aural surgery has made immense progress, particularly in the last twenty years, and with this progress it is beginning to be realized that the principles of the treatment of suppurative diseases of the ear in no way differ from that of suppurative lesions elsewhere in the body. This progress is largely due to a more careful study of the anatomy of the ear and its surrounding parts, and, in order that you may be able to appreciate what I have to say, I will first remind you of some of the more important anatomical points. A reference to figures II. and III. shows that, *externally*, the middle ear is bounded below by the membrana tympani (the least resistant of its walls), and above by the outer wall of the attic. *Anteriorly*, the inner and outer walls meet in front, and from their upper part arises the Eustachian tube. The Eustachian tube does not come from the floor of the middle ear, as is usually supposed. A probe passed along the Eustachian tube will pass between the malleus and incus, and go direct into the antrum. *Posteriorly* is the opening into the antrum through the aditus. The *aditus* is bounded above by the tegmen tympani, and its floor is formed by the prominence of the external semi-circular canal. The facial nerve runs along the upper margin of the inner wall and dips beneath the external semi-circular canal as it turns downward in its passage to the stylomastoid foramen. The *inner* wall is principally formed by the promontory, which is the outer wall of the inner ear. The *roof*, or tegmen tympani, is, next to the membrana tympani, the thinnest wall of the middle ear. It forms the roof of the attic, aditus and antrum; along it runs the petro-squamous suture, which is patent in infancy, and

\* Delivered on December 1, 1904, to the London Hospital Medical Society.

through which tiny vessels pass. The floor which lies below the level of the membrana tympani and Eustachian tube varies in thickness; the bulb of the jugular vein lying in the jugular fossa is sometimes actually in direct communication with the middle ear, or only separated from it by bone of the thinness of paper.

The middle ear is lined by mucous membrane, which is directly continuous with that of the pharynx by means of the Eustachian tube. This would lead one to expect that any inflammation or catarrh of the naso-pharynx would tend to spread to the middle ear, and this is often the case.

The causes of middle ear suppuration may be classified as follows:

(1) *Causes leading to a post-nasal catarrh.* In a child this is usually due to adenoids; in an adult, to a cold, to chronic rhinitis or nasal obstruction. You must, however, remember that simple nasal obstruction or disease does not necessarily cause middle ear trouble; it is only when the post-nasal space becomes involved that the ear tends to become affected. In these cases the swelling of the mucous membrane closes the lumen of the Eustachian tube. The middle ear now is converted into an enclosed box, with the result that the air becomes exhausted, and in consequence of this the membrana tympani becomes retracted, the mucous membrane congested, and exudation of fluid takes place. This is known as a simple "tubal catarrh." If no micro-organisms be present suppuration will not occur, but the middle ear now forms a most excellent nidus for micro-organisms, and is therefore very liable to become the seat of suppuration.

(2) *Direct infection.* (a) As a result of influenza, or some of the specific fevers, such as scarlet fever, measles, or typhoid, middle ear suppuration may occur. It may arise either from infection of the middle ear through the blood stream, or be secondary to a tonsillitis and post-nasal inflammation. (b) Through the Eustachian tube, e.g., after operative procedure in the post-nasal space (removal of fibromata or adenoids), or from plugging the posterior nares to arrest epistaxis.

(3) *External causes.* From the employment of a septic Eustachian catheter or bougie; from injury to the membrana tympani by a foreign body, or from the involvement of the middle ear in a fracture through the middle fossa of the skull.

The *Symptoms* of an acute inflammation of the middle ear are the same as those occurring in an inflammation elsewhere in the body. Take for comparison a knee-joint. Acute inflammation of the knee produces pain, pyrexia, bulging of the synovial membrane from fluid in the joint, perhaps also redness of the skin over the joint, and loss

of function. So also in acute inflammation of the ear we get earache, pyrexia, bulging and redness of the membrana tympania, and loss of function (deafness). The treatment in both cases is similar. In the early stage, before the exudation has become purulent, expectant measures are adopted—rest, aperients, diaphoretics, and sedatives locally. If there is evidence of pus an incision is necessary to let it out.

*Paracentesis* is indicated when the membrana tympania is red and bulging, when, in spite of treatment, pain persists and prevents sleep, and when there are head-symptoms. The younger the patient the more marked, as a rule, are the symptoms, and in infants they may even simulate meningitis. It is better to incise the membrana tympania too soon than to risk more serious complications. If paracentesis be performed aseptically it can do no harm. To do this operation properly, you must have a good light and make a free incision, incising the membrana from its lower and posterior part up to Shrapnell's membrane, in order to insure free drainage from the attic and antrum. After the incision it is not necessary to syringe out the ear, but merely to lay a small drain of gauze in the external meatus and to change it frequently. Syringing should only be done if the pus is very thick and copious. After a few days the discharge rapidly diminishes, and the perforation may heal from within a few days to the end of four weeks.

Acute middle ear suppuration may end in—

- (1) Complete cure, with restoration of hearing.
- (2) Cessation of the purulent discharge, with healing of the perforation, but deafness remaining. This may be due to adhesions taking place between the ossicles, or between the membrane and the inner wall of the middle ear.

After inflammation about a joint, to prevent adhesions forming and thus impairing the movements, or function of the joint, massage and passive movements are often necessary; so in the ear, after the acute inflammation has subsided, we make use of the Politzer bag and of the pneumatic masseur.

(3) *Chronic otorrhoea*. The perforation may not heal, and the condition passes from an acute to a chronic middle ear suppuration. This may be due to many causes.

(i). In the earlier stages, before the bone has become involved, it may be the result of the poor state of health of the patient, but more often is due to lack of free drainage and neglect to keep the ear clean. Asepsis and free drainage are very necessary factors in promoting a cure of middle ear suppuration.

(ii). *The perforation is very large*—this leads to continuous irritation of the mucous membrane through the external meatus. The treatment consists in the use of astringents, such as rectified spirit or weak silver nitrate solution, and the puffing in of boracic powder. Powders should only be used in the case of large perforations. Where a perforation is small the puffing in of powders is contra-indicated, as they may prevent drainage by blocking the perforation. Cotton wool should protect the ear.

(iii). *The cause has not been removed.* Often the primary cause of a middle ear suppuration lies in the naso-pharynx—adenoids should be removed, and anything producing post-nasal catarrh should be treated after the acute stage has passed.

(iv). *Insufficient drainage.* The perforation may be too small or situated high up. If so, it should be enlarged.

(v). *Local retention of pus in various parts.* Although the middle ear is generally affected in its entirety by an acute suppurative inflammation, yet occasionally it may be limited (a) to the *attic*. In this case, owing to the anatomy of the part, drainage is difficult, as the pus can only escape through Shrapnell's membrane; drainage is assisted by daily washing out the attic by means of a fine syringe with a bent nozzle, called a Hartmann's syringe. In other cases, the suppuration seems limited (b) to the floor or "cellar" of the cavum tympania—that is the part lying below the level of the Eustachian tube. If the perforation of the membrana tympania be fairly large, one of the best methods of treating such a case is to wash out the ear *via* the Eustachian tube. The principles aimed at in such cases are cleanliness and good drainage.

A chronic middle ear suppuration is more often due to deeper lying causes.

(vi). *Polypi and granulations.* Polypi and granulations may be due either to a local inflammation of the mucous membrane, or be the result of some disease of the bone beneath. They should be removed under a local or general anæsthetic, small granulations by curetting, and polypi by the aural snare. A simple polypus, or some tiny granulations which do not recur, generally arise from the mucous membrane. Repeated recurrence after removal signifies disease of the bone, which is often confirmed by use of the probe. Polypi always come from the middle ear. Polypi which apparently come from the external meatus in reality form those rare cases where they protrude through a fistula into the external meatus through the outer wall of the attic above, or the anterior wall of the mastoid behind. Polypi and granulations may spring from the inner surface of the



membrana tympani or any part of the middle ear. Before deciding on treatment it is necessary to know their exact situation. To discover this it is necessary to make use of the aural speculum. To perform the mastoid operation, merely because a polypus or a few granulations exist in the middle ear, is not necessarily justifiable—often it is not.

Recurrence of granulations and polypi in Shrapnell's membrane, just in front of or behind the malleus, may mean disease of the malleus or incus; or if from the inner wall or floor of the cavum tympani, of the bone beneath these parts. In such cases, if the membrana tympani still exists in its upper posterior part (the region of the aditus), it would be quite wrong to do a mastoid operation before having attempted the minor operation of removal of the malleus and incus, or the curetting of the inner wall or floor of the middle ear respectively.

(vii). *Mastoid disease* may be either acute or chronic. Acute mastoiditis may be the immediate result of an acute middle ear suppuration, or occur at any period in the course of a chronic otorrhoea, where the mastoid has been affected for a considerable period. Acute mastoid disease is usually due to inefficient drainage, especially when it supervenes in a chronic case.

*Acute mastoid disease.* It may be asked why do some cases of acute middle ear suppuration end in acute mastoid disease, whereas others do not? It is largely dependent on the virulence of the micro-organism and the variation in structure of the mastoid cells.

In addition to the symptoms of an acute middle ear suppuration, there is pain and tenderness behind the ear over the body of the mastoid. There may also be oedema or a fluctuating swelling behind the ear, due to periostitis, or to pus having escaped through the bone, and formed an abscess beneath the periosteum. The ear is usually pushed down and forwards. Pain on pressure over the tip of the mastoid often occurs in a simple middle ear suppuration, and does not necessarily mean mastoid disease.

If the case is seen early, when there is only slight pain over the mastoid region, free drainage of the pus from the middle ear, together with the application of leeches behind the ear, followed by warm boracic compresses, sometimes seems to do good.

*The indications for performing the simple or acute mastoid operation are—*(1) when there is an obvious abscess behind the ear, as a result of acute mastoid disease; (2) if, in spite of prophylactic treatment for three days, the pain over the mastoid and pyrexia persist, even if there be no definite abscess; (3) if, in spite of free

drainage, there are head symptoms; (4) if the otorrhœa is profuse after two months' careful treatment, although there be no signs of mastoid disease, because continuance of a profuse discharge for so long a period means that the mastoid cells must be affected.

The sooner the abscess behind the ear appears the less urgent are the symptoms. The most dangerous cases are those where there is intense pain and pyrexia with no outward signs of disease except, perhaps, tenderness on deep pressure. In the former case the bone is probably thin and the mastoid cells large, allowing free exit for the pus; in the latter the mastoid is probably sclerosed and the pus is under much greater tension, as it has more difficulty in escaping.

If operation becomes necessary, Schwartze's operation is the one to do. A curved incision is made behind the ear, which is pulled forward, and the bone is exposed over the mastoid region. The antrum is opened by chiselling away the bone over an area of half an inch square, bounded in front by Henle's spine and above by the temporal ridge. In the majority of cases there is a fistula through the body of the mastoid leading into the antrum. In cases where the mastoid is sclerosed, one may have to chisel some distance before pus is found. Beginners usually chisel the bone too low down; it is best to keep high up close to the temporal ridge, until the antrum is found. Make a large opening and remove all the mastoid cells. When the operation is finished, it should be possible to pass a curved probe through the aditus into the middle ear. The posterior wall of the external meatus is left intact, and the fibrous portion of the meatus is not separated from it. The object of the operation is to drain the antrum and mastoid cells, but to leave the middle ear and ossicles untouched.

"Wilde's incision" is only a temporary measure; it is only permissible in infants where pus may have escaped through the squamo-mastoid suture, and produced a mastoid abscess, without there being any true disease of the bone. In children and adults a mastoid abscess means disease of the bone. "Wilde's incision" may temporarily relieve, but will not cure. The after treatment in Schwartze's operation consists in packing the wound so as to make it granulate up from the bottom. Hearing should eventually be restored to normal.

*Chronic mastoid disease.* I have already mentioned that polypi and granulations occurring in the anterior upper or lower part of the cavum tympani not necessarily mean mastoid disease. When, however, granulations and polypi are found in the upper posterior quadrant of the membrana tympania and recur repeatedly after

removal, they practically always signify bony disease of the wall of the aditus and antrum, and possibly of the mastoid cells.

In cases of chronic mastoid disease, the patient may suffer from no inconvenience for years, beyond deafness and a slight, perhaps intermittent, otorrhœa. One cannot foretell, however, what may happen. About 2% of such cases die from some intracranial *suppurative* lesion; by far the majority (over 80%) of cases of brain abscess and lateral sinus thrombosis, are the sequelæ of chronic suppurative middle ear or mastoid disease.

A patient suffering from chronic mastoid disease usually comes for treatment with a history that the discharge has ceased for the previous two or three days, and since then there has been pain radiating up the head, or deep seated earache, or even attacks of vertigo. Such symptoms mean that the pus has been unable to escape, probably owing to polypi and granulations blocking up the aditus or the middle ear. Such symptoms must not be ignored: they are danger signals.

Apart from such symptoms and a history of an otorrhœa of old standing, much can be learned by examination of the ear itself. Mastoid disease may be diagnosed if there are polypi and granulations, and pus coming from the upper posterior part of the middle ear, and especially if there is a fistula through the posterior or upper wall of the external meatus leading into the mastoid or antrum, or if the probe shows evidence of carious bone. Externally one may also find a fistula, usually close behind the auricle, but sometimes some distance behind and below it, leading down to carious bone.

If the mastoid cells are large, and there has been an acute attack on the chronic condition, the signs and symptoms may closely simulate a simple acute mastoid abscess. Diagnosis can be made from the history of the case and also by the examination of the middle ear. In chronic cases one may find a thick edged perforation, granulations and fistulæ; whereas, in an acute case, the membrana tympani may only be partially destroyed, and there will be no granulations present. This is an important point, as the operation in the acute, supervening on the chronic case, is the radical or complete operation, whereas, in the simple acute mastoid, Schwartze's operation is sufficient.

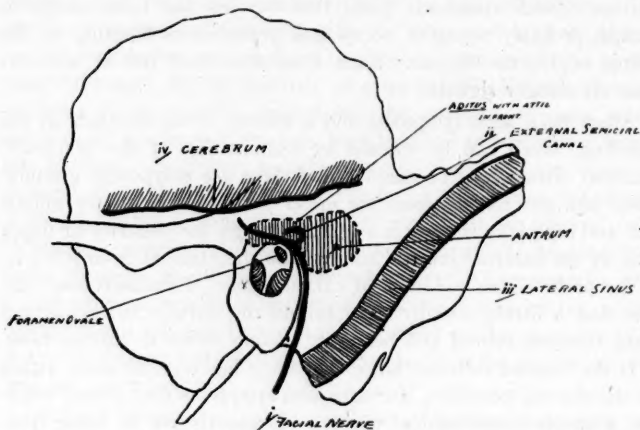
*The indications for the complete mastoid operation may be summed up as follows:*

(i). As a *prophylactic measure*—when, after careful treatment for over a year, otorrhœa persists in spite of free drainage. In such cases one can justly advise operation, although it is not urgent, on

the grounds that after a year the ossicles are either so diseased, or their attachment so destroyed, that their function for the production of hearing is damaged beyond repair. In such cases there is deafness, which a complete mastoid operation should not make worse. The operation removes the danger of intracranial or other complications. Also, if patients are going to foreign parts, where they will be unable to obtain efficient medical treatment, operation is justifiable if there is fair reason to suspect chronic mastoid disease.

(ii). After repeated recurrence of polypi and granulations, especially in the upper posterior quadrant.

(iii). Recurrent attacks of giddiness, headache, radiating up the affected side and a feeling of nausea, in a chronic otorrhœa.



*The "FOUR ENEMIES" of the Aural Surgeon*

[After LERMOYEZ]

FIG. I.

(iv). *Stenosis of the external meatus*, whether from exostosis, traumatism, or as a result of thickening of the soft parts from the irritation of the purulent discharge. The reason for operating is that drainage is impossible.

(v). *Cholesteatoma*—because it is the commonest cause of otitic intracranial suppurative lesions.

(vi). *Fistulae*—showing obvious sign of carious bone.

(vii). *Facial Paralysis*. When occurring in a chronic otorrhœa may mean either that there is bone disease round the facial canal,

or that the pus is spreading through the Fallopian canal towards the inner ear. In either case operation is indicated.

(viii). *Intracranial lesions.* As the origin of the disease lies in the middle ear or mastoid, the complete mastoid operation should first be performed to remove the primary cause, and also it renders further operation easy. In children, sometimes in adults, apparent intracranial symptoms may be relieved by the complete mastoid operation.

Otitic intracranial lesions always spread by contiguity from the primary focus. By first performing the complete mastoid operation, it is often possible, in difficult cases, to tell where the abscess will be situated by tracing back a carious patch of bone.

(ix). *Tuberculosis of the middle ear.* If the patient's general condition permits of it, and the pulmonary disease is slight or arrested, the complete operation should always be done. The difficulty is to remove all the diseased bone. If you can do this, the case will heal quite well.

(x). *Acute mastoid disease occurring in a chronic otorrhoea.*

The steps of the *complete post-aural* operation are:

(a) To make a curved incision behind the auricle, to expose the bone over the mastoid region, and to separate the fibrous meatal wall from the bony meatus posteriorly.

(b) To find the antrum, as in the acute case.

(c) To remove the posterior wall of the external meatus, the outer attic wall and the ossicles (malleus and incus), so that after the operation is finished there is one large cavity, consisting of the cavum tympani, attic, antrum and mastoid.

The dangers of the operation consist in injuring the facial nerve, the external semi-circular canal, the dura mater above, and the lateral sinus behind. The facial nerve should never be injured by the chisel, as it lies beneath the external semi-circular canal which always stands out prominently as a white bony mass on the floor of the aditus. The dura mater and lateral sinus may be exposed during the operation: this does no harm. Unless one forcibly directs the chisel at right angles to their surface, it is very difficult to injure them. In operating on a mastoid, one must have a good light, and see that the field of operation is kept free from blood. To work blindly in a pool of blood is unsurgical. The chisel or gouge is the best instrument to use at first, but the electric burr is useful to smooth off rough edges.

(d) The fibrous meatus is now cut through along its posterior wall, above and below, as far outwards as the concha, so as to form

a posterior or Körner's flap. This flap is turned back and stitched to the skin behind the auricle. The finger should be pushed through the external meatus to enlarge it—splitting it if necessary. The edges of the posterior wound are sutured, and the mastoid cavity packed from the external meatus. The enlarged meatus permits of easy packing, and, by the time the packing is no longer necessary, it has become restored to its normal size, leaving no deformity but a linear scar on the concha. After the first week the cavity should be packed daily with sterilized gauze. The cavity should be packed carefully and evenly. After the first two weeks granulations spring up. They must be kept in check by caustics and curetting—which is not often necessary.

Personally, I prefer this method to grafting. If "skin-grafting" be done, it is usually done about the tenth day. At this period it is impossible to say if all the carious bone has been removed. In some cases, however careful one may be, all the carious bone does not get removed. A skin graft may apparently cause healing, but unless the underlying bone be perfectly healthy, sooner or later further bone trouble will occur, granulations will break through the skin-graft, and a "relapse" is the result. If packing be employed, the skin which grows in from the external meatus and posterior flap will not grow over any spot unless it be healthy. When the skin has completely covered the wound surface, one knows for certain that there is a permanent cure.

*Results of the mastoid operation.*

In the acute cases, the middle ear and the hearing should be restored to normal.

In the chronic cases, where the complete mastoid operation has been performed, healing takes place in about three months. With regard to hearing, if the operation and after treatment have been successful, and if the patient has been suffering from a middle ear disease, the internal ear not being affected, the hearing is usually better after than before the operation. On an average, whispering should be heard about six feet off, and ordinary conversation more than double that distance. As you have seen to-night, some of the patients on whom I have performed the complete operation can hear whispering as far as 20 feet off. Hearing after the complete post-aural operation should be no worse than after the removal or loss of the ossicles (malleus and incus).

In comparing the Schwartz's operation with the complete post-aural operation, the simple opening of the antrum and mastoid cells in no way destroys the function of the ear, and it removes the



possibility of future chronic mastoid disease and its complications. I think, on the whole, it is done too seldom. The complete post-aural operation on the other hand is more difficult to perform, and it necessarily means a partial loss of function of the ear. This oper-

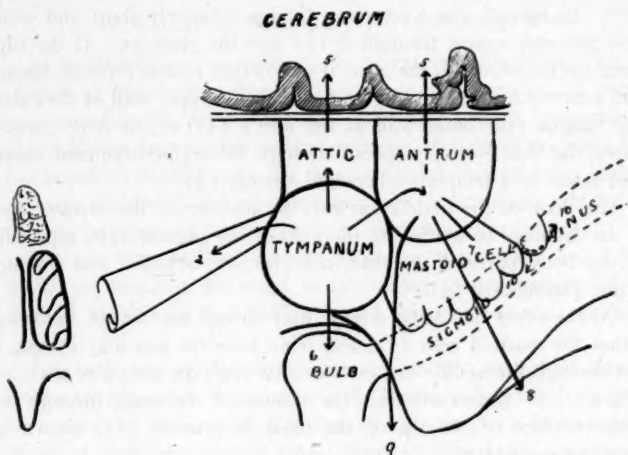


FIG. II.

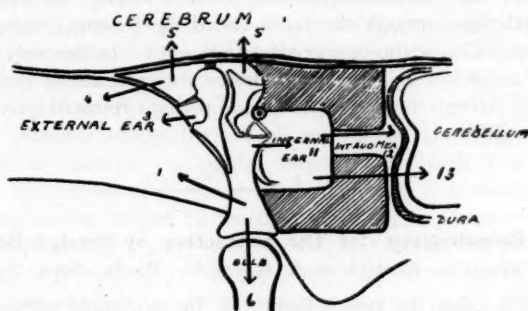


FIG. III.

ation should only be done when absolutely necessary. I think it is done too often, before sufficient trial has been made of conservative treatment.

I have not time to enter into the subject of intracranial complications due to middle ear suppuration. I would like, however, to

draw your attention to the diagrams, which show you in what direction infection may spread. As I have already said, the infection spreads by contiguity. Consider again the middle ear as a box. Owing to the outer wall (the membrana tympani) being the least resistant, the pus usually finds its exit by rupture of the membrane (1). In infants, the Eustachian tube is relatively short and wide, and pus may escape through it (2) into the pharynx. If the suppuration be limited to the attic, it may either escape through Shrapnell's membrane (3), through a fistula in the upper wall of the external meatus (the outer wall of the attic) (4), or, in some chronic cases, the infection may spread through the tegmen tympani above, and result in a temporo-sphenoidal abscess (5).

The floor of the middle ear may be the site of the disease, and, if the drainage be inefficient, the bulb of the jugular vein, especially if the bony partition be thin, may become infected and produce septic thrombosis (6).

On the other hand, the disease may spread backwards, involving either the mastoid cells (7), and from here the pus may escape, if not through the middle ear, outwards through the cortex of the mastoid (8), or downwards into the tissues of the neck, through the inner surface of the tip of the mastoid process (9), known as Bezold's mastoiditis.

From the mastoid cells again, the lateral sinus (10) or the cerebellum behind it may become infected.

Finally, the infection may extend inwards through the inner wall of middle ear, through the facial canal, the fenestra rotunda and fenestra ovalis, or the promontory itself (11). In this way it may extend direct to the internal auditory meatus, and set up meningitis (12), or through the petrous bone, and perhaps result in a cerebellar abscess (13).

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#### **Direct Bronchoscopy for the Extraction of Foreign Bodies—**

NEHRKORN—*Deutsche med. Wchnschr.*, Berlin, Sept. 29, 1904.

In three cases, the author found that the prolonged manipulation necessary for the removal of soft and succulent foreign bodies, such as a bean, by means of Killian's bronchoscope, produced such a reaction in the larynx, that tracheotomy became necessary. He therefore urges that in such cases, especially in children, inferior bronchoscopy through a tracheotomy wound be done at once.

YANKAUER.

## ACUTE MASTOIDITIS AND THE MASTOID OPERATION IN CHILDREN.\*

BY WALTER A. WELLS, M.D., WASHINGTON, D. C.

Notwithstanding the voluminous literature to be found on the subject of Mastoiditis, which is every year the occasion of numerous contributions in our medical journals, and of frequent and ardent discussions in our medical societies, strange to say, very little has appeared dealing with the peculiarities of this affection incident to early childhood and of the important modifications which have then to be observed in the operation performed for its relief. The text books have little or nothing to say on the subject, and I have never yet heard it discussed in this phase at the meeting of any medical society which I have attended, local or national, special or general.

Just why this neglect I am not able to say, and shall leave to others to discover. But that a wide hiatus exists which ought to be covered by a thorough diffusion of knowledge of this particular phase of mastoiditis, much more thorough than I am competent to give, I maintain for the following reasons:

1. Because in childhood, on account of the difficulties of getting a satisfactory history, and especially because of the difficulty of obtaining a good examination always of the tympanic membrane, the physician needs to be put on his guard for the occurrence of this affection and well posted on the various signs which may lead to its recognition.

2. Another reason for a more widespread knowledge of mastoiditis in children, and of the dangers with which it is attended is to be derived from the general ignorance and indifference of parents on the subject of "running ears." The common idea prevailing that it is a good thing for the ears to run and a bad thing to stop the running in all probability had its origin in a faulty application of logic to the phenomena observed in the evolution of the very condition we are here discussing. A child with a suppurative otitis is doing well, when suddenly the discharge stops, and coincident with this stoppage serious complications arise which may prove fatal in their consequences. The non-professional observer naturally attributes the bad turn to the cessation of the discharge,

\* Read before Medical Society of Washington, D. C., October 12, 1904.

and does not distinguish between a stoppage due to measures which cure the disease and that due to some mechanical obstruction which has but forced the pus back through the aditus into the antrum and adjoining cells.

3. A third reason for the need of more attention to this subject, is that on account of essential anatomical differences in the mastoid of adult and infant, the instruction given for operating in the former might produce disastrous results if applied in the case of the latter. Of this we will have more to say later.

4. Finally, mastoiditis, a serious affection at all ages is common in children. This might be suspected when we consider the relative much greater frequency of middle ear suppuration in children, due no doubt, to the prevalence of adenoids, and the various acute infectious fevers—of which otitis media is a common complication—especially measles, scarlatina and diphtheria.

This supposition of the frequency of mastoiditis in children is amply verified by the statistics of such observers as have made a compilation of these cases with respect to the age of the patient. Schwartz's tables showed that in 100 cases, 61, that is to say, more than three-fifths, were between the ages of 2 months and 20 years. This accords with an analysis made by Cordoro and Amadoni (II *Progresso Medico*, Aug. 25th, 1904), of 165 cases of mastoid suppuration observed in the surgical clinics of Parma, wherein it was found that the greatest number of cases occurred between the ages of 10 and 20, and the next greatest number between 1 and 10 years.

In this connection I would like to draw your attention to an article by Babillon, which appeared last November in a French journal devoted to diseases of children (*Rev. mensuelle des maladies de l'enfance*), and which I happen to have seen reviewed in another French journal, one devoted to diseases of throat and ears (*Ann. des mal. de l'oreille, du lar., etc.* Paris, 1904, XXX. p. 169). The writer, as a pathologist to an institution in which children were treated, had occasion to make many autopsies on children, and he made a systematic examination of the aural cavities in a large series of cases.

The result of these examinations is certainly astonishing, and the lesson learned should be taken seriously to heart, since it is not mere guess work, but the actual experience derived from the post-mortem table. According to Babillon, in children who die in a hospital in which they are surrounded by other children suffering from various kinds of infections, a suppurative condition of the

middle ear cavities is a rule and its absence an exception. For example, in a series of 15 successive autopsies he found 13 times the antrum and tympanum filled with pus, without perforation of the drum membrane. In another series the same pathological condition was found five times; and in another of seven, both ears were thus affected in six cases and the seventh case had one ear affected.

The condition was rarely suspected during life, the drum heads not having been perforated and the little patients presenting symptoms which indicated a disturbance of the gastro-intestinal tract. The diagnosis is of necessity difficult, but, according to Babillon, if it be noticed that the patient, instead of exhibiting an intense thirst, as in the case in gastro-enteritis, refuses water as well as all nourishment, and, instead of being restless, is dull and apathetic, and if it further be found that the proper dietetic treatment is without avail, we may very strongly suspect a suppurative condition to exist in the cavities of the ear. An examination of the ear would help much to clear the uncertainty, but, as stated, it is often unsatisfactory in very young children.

Mr. President, the dry details of anatomy have usually very little fascination for a body of practising physicians, and if it were possible to avoid them I should certainly not willingly inflict you. But the subject of mastoiditis and the mastoid operation in children is so intimately bound up in the anatomy of the mastoid that it cannot be intelligently discussed without frequent anatomical references, and it is only, therefore, that my paper may not prove even more tiresome and uninteresting, as it might in the other case, that I have thought it best to invite your attention in the beginning to a few important practical anatomical points that particularly distinguish the temporal bone of a child from that of the adult.

Having before us the temporal bone of a fully grown individual and another of a child at the time of birth, perhaps the first thing to strike us, outside the difference in size, would be the absence in the child's temporal of the mastoid apophysis. Until about the age of two years there is practically no mastoid process; at two years there is a small, insignificant tubercle which does not become fully developed until the age of three or four years. In the new born, therefore there is, strictly speaking, no mastoiditis nor mastoid operation, but the disease might be called instead an antritis (or inflammation of the antrum) and the operation done for its relief antrectomy.

The next anatomical feature to strike us as characterizing the infant's temporal would very likely be the absence of an osseous external meatus. We see instead only the wide tympanic orifice opening directly into the tympanum. Its circumference for three-quarters of its extent is formed by the tympanic ring, the other fourth at its upper part being the so-called Rivinian segment. As age advances the tympanic ring develops to form the anterior and lower part of the posterior wall and floor of the canal, the proof and superior part of posterior wall being formed by a growing inward of the so-called superficies meatus of the squamous portion at the location of the Rivinian notch.



A third peculiarity which would attract our attention upon only a casual view of the infantile temporal bone, is the clear marking of the sutures which separate the three distinct parts—the squamous, petrous and tympanic portions—which enter into its formation. Very often in the newborn these three parts can be easily separated one from another without breaking.

On the outer surface, running almost vertically between the squama and the petrous portion, is the squamo-mastoid suture which usually persists sufficiently to be made out throughout life. In the infant it may be quite gapping, and the periosteum dipping



down into crevices. In operating one must exercise considerable caution, therefore, in attempting to separate the periosteum at this location, as the frail bone may be unintentionally penetrated by the rough use of the instrument.

A fact important to be remembered is that in the newborn the facial nerve makes its exit upon the outer, instead of the under surface of the petrous portion of the temporal bone. For this reason we cannot with impunity employ the scalpel or periosteal retractor in this locality.

Looking now upon the inner or cerebral aspect of the temporal, one will note in the case of infants a well marked, horizontal cleft at the lower border of the squama which indicates its union with the petrous portion. In the adult this suture is scarcely visible; in the newborn it is often a pronounced cleft, filled with vascular and connective tissues, constituting, it may be, a dangerous pus channel from the middle ear to the brain.

The manner of the development of the squamous portion throws some light upon the anatomy of the antrum. At first the two plates of which it is formed are in apposition throughout, but later they separate below, the inner plate tending toward a horizontal direction to meet a similar plate from the petrous portion which extends outward and covers for a little distance the former, their junction forming the petro-squamous suture just referred to. The outer plate of the squama continues its vertical direction, the space between being filled in with spongy tissue. This spongy tissue is most abundant at the back part of the squama, at the level of the squamo-mastoid suture, but extends also forward even into the root of the zygoma. From it are formed the antrum, aditus and the attic. It explains also the presence of cells which are often found just above the osseous canal and forward in the root of the zygoma.

In the newborn and very young children there is but one mastoid cell, the antrum. It is very superficially placed above and behind the tympanum, and connects by a wide canal (the aditus) with the tympanum. As age advances the antrum in the course of development describes an arc about the upper posterior part of the meatus going downward and backward, and at the same time continually receding from the surface. In the new born it is located just within the posterior inferior end of the squama. The linea temporalis and the spine of Henle being absent, as already stated, cannot be relied upon to guide us to its location; but fortunately we have a valuable land mark in the presence of a number of vascular foramina, situated just above and posterior to the meatus.

This area when exposed, will appear as a more or less hyperemic area, and will be found, when attacked with the curette, to be soft and friable. This is the area designated by Chipault as the zone *criblée retro-meatique*—the cribriform area—but more commonly spoken of as the *tache spongieuse*—the spongy spot. In the newborn and in children under two years it corresponds very accurately with the location of the antrum.

A knowledge of the anatomy of the child's temporal, besides being essential from a surgical standpoint, is of considerable assistance in understanding the peculiarities which characterize the pathology of mastoid inflammation in children. For example, the fact that intracranial complications are comparatively less frequent, notwithstanding the more open conditions of the sutures, finds its explanation in the situation of the antrum upon a higher plane than the tympanum, and its freer communication with the latter cavity, whereby drainage through the middle ear into the external auditory canal is greatly favored.

The more frequent perforation of the mastoid cortex, with the formation of fistulæ and large post-auricular abscesses in children, is easily explained by the more superficial situation of the antrum and more or less patent state of the squamo-mastoid suture.

The readiness with which infection from the tympanum becomes extended to the outer surface of the mastoid, setting up a periostitis in this region, might be explained either by the absence of an osseous meatus and the direct connection therefore between these two parts, or by the presence of the spongy part referred to, which may act as an intermediary for the propagation of the infective process.

The indications for operation in children are in general the same as for adults, bearing in mind the greater tendency in children to have profound constitutional symptoms from slight cause. A mere periostitis may in a child produce such general disturbance as in adults would occur only in a mastoiditis; and a mastoiditis, such symptoms as in adults would point to meningitis or cerebral abscess. For a periostitis the so-called Wilde incision, a simple incision over the seat of swelling, just posterior to the attachment of the auricle, carried well through integument and bone, is justifiable and is attended with success. If it be, however, a true case of mastoiditis the Wilde incision is useless, because insufficient to effect a cure. A thorough trephining is just as necessary in the young child as in the adult.

This was well illustrated in a case which I saw at the Episcopal Eye, Ear and Throat Hospital in consultation with Dr. Maurice Miller, in which two months previously an operation had been performed amounting to something more than a Wilde incision, inasmuch as curetting had been done, but no connection made with the middle ear. The patient, an infant of 15 months, seemed to do well for a while although the ear continued to run. The latter part of March, about two weeks before the second operation, however, the ear ceased to run, and at the same time the patient's general condition grew worse. He became pale, restless, fretful, and refused nourishment. April 7, a considerable edematous swelling appeared behind the ears, and the temperature on that and the following day varied from 102 to 104 F. April 9, a typical operation for a child of that age was done; the antrum easily found and perfect connection made with the middle ear. The temperature fell at once to normal, and the general condition began to improve. The mastoid wounds healed rapidly, but the discharge from the ear persisted longer than usual. It finally ceased permanently about May 3.

Another case in which I unfortunately did not get such a happy result, illustrates even more emphatically the necessity of a thorough operation and curetting of the bone in children. This was a colored boy, aged 15, on whom I operated at Garfield Hospital last spring. There was only a slight fever, but great pain, especially at night, and tenderness and swelling over the mastoid. The feature of the case was the complete closure of the external auditory canal by swelling, shutting out any view of the drum membrane. I trephined the mastoid and found pus in the antrum.

For a while the patient did apparently very well, but later it was observed that the mastoid wound failed to close and that small abscesses formed in and about the auditory canal. These abscesses were opened from time to time, but it is evident that eventually this patient will again have to be put under an anæsthetic in order that the parts can be thoroughly exposed and curetted.\*

While the patient was under observation this summer I had occasion to operate upon another of exactly the same age. The patient, a girl, referred to me by Dr. Bowen, had for the previous three weeks suffered from a fullness and deafness in the right ear, with unusually intense otalgia and headache, but attended with

\* Since reading article, secondary operation has been performed in this case. The external abscesses in the vicinity of the ear were found to be in direct connection with the necrosed bone in the mastoid region. The bone adjacent to the auditory canal was broken down, very extensively, and the curetting had to be continued all the way to the tympanum, and the ossicles removed. The wound is at present rapidly filling with healthy granulations, and the indications point to recovery without further complications.

little or no discharge from the ear. The earache grew worse and pain over the mastoid and neighboring region developed. The pain was particularly severe at night. When first seen, Aug. 11, the mastoid was red and tender especially over the location of the antrum. The drum membrane was very red but not bulging, and showed a very small perforation at its anterior inferior quadrant. The temperature was 100 and a fraction.

The patient was sent at once to the hospital, a paracentesis performed, and ice applications ordered. Not the slightest improvement manifesting itself in the course of 48 hours of constant application of the ice bag, I decided to trephine Aug. 16. The antrum was easily found, and contained pus. For the next couple of days the patient suffered some pain and had fever, which was found to be due to a co-existing follicular tonsillitis, and which was found to disappear when same was relieved. The wound granulated in this case very rapidly at first, and when apparently almost healed the patient was allowed to return to her home in the country. About a month later the wound having still refused to close completely, she again consulted me, when I found a small sequestrum of necrosed bone superficially located in the wound. Upon its removal and a curettement of the surrounding area, the case progressed normally toward recovery.

In children, because of the difficulty in the way of obtaining a reliable history, and because the constitutional symptoms are so often out of proportion to the local state, it is necessary to very closely observe the physical or objective symptoms which may be present, viz: the condition of the mastoid process as regards swelling, fluctuation and tenderness, the condition of the external auditory canal, the appearance of the membrane, and the character of the discharge.

The following case, which I saw in consultation with Dr. Polk-inhorn, is interesting because of the extensive local destruction found upon operation, notwithstanding the complete absence of fever. J. L., aged 4, gave a history of having had a suppurative inflammation of the left ear a year previously, which got well and remained so until about February 1, when a fresh suppuration set in. February 13, a swelling was observed behind the left ear, but the patient did not appear to suffer much general disturbance. He was admitted to the hospital February 18, and was found to have no rise in temperature. There was a large fluctuating tumor behind the ear, tender to the touch. A thick, yellow discharge exuded from the external canal; there was no sagging of the posterior

wall of the canal. Operation was performed the same day, assisted by Dr. Polkinhorn. Upon incision over seat of swelling, a large quantity of pus was evacuated. When the mastoid cortex was exposed, two fistulae were found, one below the other, the upper just posterior to the meatus, leading directly into the antrum. The bone was found necrosed over an area of about one square inch, and the entire tip was broken down and had to be removed. The patient developed no temperature after the operation and made a rapid recovery, the external wound closing in about four weeks, the discharge from the ear having previously ceased.

In striking contrast to this case I could mention that of a child fifteen months old which I saw in consultation with Dr. Sothoron. Here there was a high fever and symptoms of a pronounced cerebral type, such as great restlessness day and night, refusal of nourishment, and a condition of apathy at times amounting to coma, associated with insignificant local symptoms. A swelling appeared back of the ear, but it was not edematous or fluctuating, and the discharge from the ear was insignificant. As the condition did not disappear under continuous ice application, it was decided to operate. The mastoid lesion was not extensive. No pus was found, but only a moderate amount of granulation tissue in the antrum. The bone was unusually dense for so young a child. The general condition, which had been so alarming, improved immediately after the operation, and the child made a good recovery.

In most of the otherwise excellent works on otology, very slight attention is paid to the technique of a mastoid operation in children, and one might be led to suppose that the operation, with the exception of one or two unimportant modifications, should be performed in the same manner as is done for the adult. But if we apply the technique of the ordinary mastoid operation to the newborn child, serious, perhaps fatal, mistakes would be the inevitable consequence.

The very initial incision might perhaps have the result of severing the facial nerve, and producing a facial paralysis, because we are directed to make an incision close behind the attachment of the auricle carried vertically downward, boldly through skin and periosteum to the bone. In the new born, the facial nerve makes its exit just posterior to the middle of the meatus, and not on the under surface of the petrous portion, as in the adult; hence the danger. In the usual mastoid operation, the next step is the forcible separation of the periosteum from the bone by means of the raspatory. But in the young child great caution should be enjoined in



regard to this step, because the squamo-mastoid suture may be open, and the point of the instrument easily thrust through it.

In the adult the practice is to trephine for the antrum just behind the meatus, using the spine of Henle and the linea temporalis as our guides. But in very young children the spine of Henle is never present, the linea temporalis very seldom. If we should depend upon the linea temporalis as a guide we might, in the absence of any ridge in the usual location, light upon the zygomatic process and be deceived into entering the middle fossa of the skull.

In the adult we begin by trephining the bone over an area whose upper limit is on a tangent passing along the upper wall of the external auditory meatus. In the newborn child this line would form, on the contrary, the lower limit of the area which must be trephined in order to succeed in entering the antrum. In the ordinary operation in the adult, after entering the antrum, it is customary with some operators at least, to follow by opening the other cells of the process; but in children under two years there is yet no mastoid process formed, and any attempt to extend the operation would probably result in a section of the facial nerve or laceration of the lateral sinus.

Briefly stated, the operation should be performed in children under the age of three years in the following way: The primary incision is made, as in adults, just posterior to the attachment of the auricle, but it should go straight to the bone only at its upper extremity. At its lower end caution must be exercised because of danger of wounding the facial nerve. Inasmuch as in the newborn and very young children there is no osseous canal, and the cartilaginous meatus is applied along its upper wall to the squamous portion of the temporal just above the tympanic orifice, the incision which is made about the meatus will bring the wound in a relatively higher position than is the case in making a similar incision in adults. This fact should be well born in mind to prevent entering the middle fossa.

There being no spine of Henle and probably no linea temporalis to serve as landmarks, the safest plan is to expose sufficiently the upper and posterior wall of the osseous meatus and search for the so-called spongy spot at a point just above the posterior tubercle of the tympanic ring. This will be found in children of two years old or under to correspond quite accurately with the location of the antrum. In children a little older we may have to take the upper and posterior walls of the canal as a guide, and trephine a



point about one-sixteenth of an inch above and behind the intersection of the tangents to these two walls.

The antrum being superficially placed, the curette as a rule will satisfactorily answer the purpose in perforating the bone. If the bone be unusually hard the chisel or gouge may be used, but of a width not to exceed 1-2 cm. The stroke of the hammer must be gentle and the instrument held carefully to prevent slipping, which might produce serious injury in the soft, friable bone in the infant. The antrum being entered, the cavity is carefully freed of all fungosities and necrosed tissue; but it is usually not needed to curette the aditus as much as in the case of an adult, because this passage is relatively larger and not so likely to become obstructed. There being, as a rule, no supplementary mastoid cells, the operation is now complete, and we do not have to extend the wound downward toward the tip, as we often have to do in the case of an adult. There remains now only to pack the wound lightly with antiseptic gauze and the operation is completed. The after treatment does not materially differ from that in the case of adults.

If it has in reality been a case of acute mastoiditis, and we have not been deceived, as is quite possible in the case of children, in regard to the duration of the otorrhea or into taking an exacerbation of a chronic middle-ear suppuration for an acute case, we may expect a rapid granulation of the wound, and an early cessation of the otorrheic discharge. If the suppurative process, on the other hand, dates back much farther than we thought, there probably exists a condition which will demand something more than the simple Schwartze operation, which is proper only for the acute form of the disease.

Whether in a case found to be chronic we call the existing process affecting the bone an osteo-myelitis with Pauzat, or an osteoperiostitis with Duplay, the practical conclusion is the same, that a cure will probably not be effected until the radical operation shall have been performed, whereby all the middle ear cavities, antrum, aditus, attic and tympanum, are thrown into one, and all granulations and fungosities carious bone or cholesteatomatous masses if present, thoroughly curetted and removed.

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## THE MASTOID OPERATION.—INDICATIONS THEREFOR IN ACUTE SUPPURATIVE OTITIS MEDIA WITHOUT MASTOID SYMPTOMS.\*

BY CHEVALIER JACKSON, M.D., PITTSBURGH, PA.

We have heard much in the last few years about the indications for opening the mastoid in chronic suppurative otitis media in the absence of mastoid symptoms, but nothing at all of a similar necessity in acute suppurative otitis media. Yet, if all the acute tympanic suppurations that showed no signs of clearing up in, say, six weeks, were operated upon, there never would be any chronic suppurations.

The cure of an acute purulent otitis media is altogether a matter of drainage. Posterior drainage per antrum will cure any ordinary case, in which the mastoid cells are not involved, in a week; and in a month the posterior wound will be healed. Why postpone an operation which probably will have to be done eventually anyway, and run great risks meanwhile?

The writer has opened the mastoid in acute purulent otitis media in the absence of mastoid symptoms 22 times, and has in no instance regretted it. Not a single case had a single untoward result, let alone mortality. Every case regained practically perfect hearing, and had no lasting tinnitus. On the other hand, he has been unable to get permission to operate in many instances; and he has never ceased to regret it. Time forbids citation of many of these cases, or detailed histories of even a few.

For the sake of brevity, only a synopsis of points germane to the contention of this paper are given:

*Case I.* A physician's child, aged 10, had been in good health until a violent acute otitis came as a complication of a mild attack of measles. For four weeks a moderate otorrhœa without much pain had followed myringotomy. The writer advised posterior drainage to save hearing, and because the infection was streptococcal, the discharge was not lessening, she was out in the country, where she could not be watched for obstruction to drainage, and, lastly, there was occasionally a little rise of temperature (99.3), occasionally accompanied by irritability. In the absence of other discoverable cause, these were attributed by the writer to slight absorptions.

\* Read at the meeting of the Middle Section of the American Laryngological, Rhinological and Otolological Society, Toledo, Ohio, February 24th, 1905.

There were no mastoid symptoms, no pain, no tenderness on deep pressure, no sagging of the posterior wall.

The father searched the literature, but could find no mention of opening the mastoid in such a case, and is not to be criticised for refusing consent to operation.

One week later, the fifth week of the purulent discharge, the child died within 24 hours of the onset of an infective leptomeningitis.

*Case II.* Jane M., aged 8, seen two years ago with a right acute purulent otitis media following whooping cough. Myringotomy and hot douching stopped the pain, but the discharge persisted for eight weeks unabated, when the writer advised operation in the absence of mastoid symptoms, for the same reasons given in Case I, except that the bacteriologic finding was staphylococcal.

The writer submitted his views to the family physician, at the same time stating that it was more radical than the most advanced otology of the day warranted. The family physician did not feel justified in advising the parents to have the operation done under such circumstances, so the matter was let drop without saying anything to the parents about it.

Eighteen months later the child was brought into my office with a right facial palsy, a foul otorrhœa, ossicular necrosis, the hearing down to loud voice at three feet, the general health shattered and growth and development arrested by the toxemia of chronic suppuration.

Had she been operated when first urged by the writer, she would have had no otorrhœa, no palsy, and hearing would have been perfect, except under the most delicate tests.

Contrast these two cases with the following:

*Case III.* Margaret X., aged 15, brought to me by her father, a surgeon of renown. A post-scarletinal streptococcal suppuration had existed for nine weeks unabated, in spite of assiduous douching, dry treatment and every other accredited method.

There were no mastoid symptoms.

When, as in the previous cases, the writer laid the situation before the father, whose surgical acumen grasped the situation promptly, he said, "By all means drain it at once." This the writer did.

The purulent discharge from the canal ceased in a week, in four weeks the posterior wound had healed, and she is now in full possession of perfect health and hearing.

*Case IV* was similar, save that there was some indication of mastoid inflammation, though there was no indication of pus in the bone.

The mastoid cells were found to contain in scattered locations a few granulations, but no pus. The bone was softened and broke down under the curette like honeycomb under a spoon. It evidently was infected, and certainly would have suppurated later. In this class of cases the risk of waiting, together with the probability of eventual operative necessity, make early operation a common sense procedure.

*Case V.* Andrew B., colored, aged 28, a driver, had an acute otitis media of extreme severity, in spite of which he persisted in driving his team in all the exposure of mid-winter. Headache and vertigo were severe, and he finally was found unconscious lying in the snow. Axillary temperature 103, pulse 110, respirations 26. When put to bed all symptoms except vertigo disappeared, temperature falling to normal in 24 hours.

The drum membrane had an ample perforation, pus was coming away freely, and there were absolutely no mastoid symptoms. In spite of this, the writer advised opening the mastoid for posterior drainage, solely on account of headache and persistent dizziness, as he deemed the risks of waiting much greater than the risk of operation.

The operation was quickly though carefully done. No pus was found. The vertigo ceased at once, the discharge from the canal ceased at the end of ten days, and the posterior wound was healed in five weeks. Hearing was nearly normal, and no tinnitus remained.

It is unnecessary to go on reciting cases. If further evidence is needed let us look at the hundreds, the thousands, of cases of foul chronic otorrhœa that swarm to our dispensaries, our hospitals, and our offices with pernicious anemia, leucocytosis, tinnitus, deafness, facial palsy, brain abscess, meningitis. Think of the years of misery in feeling that they are carrying about a foul discharge, offensive to their companions, rejected by insurance companies, and perhaps living in dread of an operation that they likely will come to sooner or later. Can any one look at these cases and deny that a little mastoid operation done early, while the condition is acute or sub-acute, and quickly curable because the bone is not affected deeply, if at all—can any one deny that the simple mastoid operation would have been but a trifle in comparison?

Basing his opinion on the foregoing and many similar cases, the writer maintains that the opening of the mastoid is justifiable in acute purulent otitis media, in the absence of symptoms of mastoid involvement, under one or more of the following conditions:

1. When the discharge *shows no signs of abatement* after having persisted for a period of eight weeks, more or less, as judgment in the individual case may dictate; usually less in streptococcal infections.

2. When there are occasionally slight temperature rises, irritability of temper, malaise, fetid breath, etc., otherwise unaccounted for.

3. When the social position of the patient makes it certain that the ear lesion will become chronic from neglect.

4. In violent suppurations which threaten the hearing, if not the life. To delay is dangerous.

5. When dependance on drainage through the canal becomes hazardous, for any reason, such as swelling of the canal.

6. When patients are going into remote districts or on a sea voyage. To allow them to run the risks of defective drainage is unwise.

7. When cerebral or labyrinthine symptoms, such as headache, nausea, vomiting, vertigo, etc., etc., are present, even though drainage seems ample, for the risk of delay here is great. If not due to actual pyogenic extensions, posterior drainage will promptly terminate the danger, as in Case V.

The objects to be obtained in opening the mastoid in acute suppurative otitis media without mastoid symptoms are:

1. To cure the patient promptly.

2. To prevent a chronic otorrhœa, with its attendant discomforts and dangers.

3. To prevent a chronic perforation with its constant re-infections.

4. To prevent a mastoid empyema.

5. To place the patient's life out of the jeopardy of intracranial pyogenic extension by other than mastoid ways.

6. To preserve the hearing.

7. To prevent incurable tinnitus.

The arguments on which these assertions are based may be briefly summarized as follows:

1. If an acute suppurative otitis media be operated upon before inflammatory processes have worked lasting pathologic changes in the ear, we can in practically every case cure the patient—that is, stop the discharge, restore hearing, cure or prevent tinnitus. After inflammatory exudates have worked permanent changes, no sur-

geon on earth can restore hearing, or cure tinnitus. Cure the discharge, he probably can in almost every case. How? By doing a radical operation. Then why not do a simple mastoid in the first place?

2. To look over the text books and the periodical literature, one would suppose that the only pyogenic extension of purulent otitis media is by way of the mastoid cells. Yet, we all see occasional cases of intracranial extension through the tympanic roof. Are we then justified in considering mastoid empyema the only indication for opening the mastoid? May we not say that it is at times demanded solely for posterior drainage to prevent intracranial pyogenic extension.

3. The risks of operation are practically nil. The risks of postponement are great. To operate after an acute pyogenic invasion has infected the arachnoid, pia, and fluids is a forlorn hope.

4. May we not also say that opening the mastoid for posterior drainage and cure of acute suppurative otitis is justifiable to prevent loss of hearing, to prevent the patient drifting into a chronic suppurative otitis media, with its years of dread and misery, its pernicious anemia, leucocytosis, tinnitus, deafness, facial palsy, brain abscess, meningitis.

As otologists, we know that the person with a chronic purulent otitis media figuratively carries a bomb shell in his head that may blow up at any time. We know that at best his life is miserable with deafness, tinnitus, and foul discharge. We are working hard every day to cure just such cases. Are we not justified in saying there ought not to be any such thing as chronic suppurative otitis media? Should we not say, "Every case of acute middle ear suppuration that threatens to become chronic should be terminated by posterior drainage through the mastoid?" I think we should.

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**The Significance of Enlargement of the Cervical Glands in Diseases of the Middle Ear—STENGER—*Arch. f. Ohrenh.*, Leipzig, Aug. 26, 1904.**

The author has observed that when the mastoid is involved in the suppurating process in the middle ear, especially in children, the glands below the mastoid process and behind the sterno-mastoid muscle are regularly enlarged. As these glands drain the mucous membrane and bone of the mastoid region, their enlargement is an essential part of the disease and constitutes an indication for operative interference.

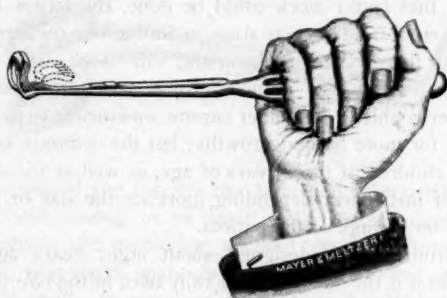
YANKAUER.



## AN ADENOID CURETTE.

BY ST. CLAIR THOMSON, M.D., LONDON.

The use of a curette for the removal of naso-pharyngeal adenoids, in preference to the various forms of post-nasal forceps, has now become almost universal. Most surgeons who have been performing this operation for more than ten years commenced with some form of Loewenberg forceps, and have gradually discarded it for the curette. The curette removes a growth so rapidly and completely, that the time occupied is very short and the risk from hemorrhage is greatly lessened. For those whose dexterity is not maintained by frequent practice, the curette is also a much safer instrument. Once introduced behind the soft palate, and carefully maintained in the middle line of the body, it can be swept backwards and downwards along the naso-pharynx without the slight-



est risk of wounding any important structure—except the projecting adenoid mass. I have never know of any operator reverting to the older instrument, when once he became used to a satisfactory form of curette. The original Gottstein form, although it detached the growth, had the drawback of not bringing it away, while there was some danger of the detached adenoid mass embarrassing the respiration. This objection was overcome by Delstanche's ingenious idea of connecting a hinged and toothed cage to the curette, so as to receive the growth. As fitted to the original Gottstein model, the toothed cage did not always appear to give sufficient space to fully receive the growth—it became too "crowded," in fact. Besides, the Gottstein form, to which it was attached, ends below in a V

point so that much of the lateral extensions of a large, square growth might easily escape the first stroke.

The Beckmann curette, with its quadrilateral fenestra, and its curve adapted to the roof of the naso-pharynx, is better suited to embrace the adenoid mass. To this curette I have had fixed a hinged, spring frame, armed with short curved teeth set close together. This will admit a mass of any size, and will prevent it from falling out of the curette. For the usual light handle I have substituted a more solid one, which can be grasped dagger-wise. Held in this position, it is easier to keep the instrument all the time in the middle axis of the body, there is no uncertainty as to where the cutting edge exactly is when out of sight (which may happen if the curette is held like a pen, when it may easily become rotated in the fingers), and the growth can be more completely shaved off by one firm stroke. When the main growth has been removed, an ordinary small Beckmann curette (18 m. m. across), fitted with a stout handle, will be found satisfactory for removing any lateral extensions which have escaped the caged instrument.

Thinking that better work could be done, the larger the instrument employed, I tried various sizes, including one measuring 1 inch across. But this proved useless, and one stock size, measuring 20 m. m. across, has been found the most satisfactory for all well-marked hypertrophies. A smaller curette, measuring 18 m. m. across, can be used for more limited growths; but the ordinary size is quite suitable for children of three years of age, as well as for adolescents, the choice of instrument depending more on the size of the hypertrophy than on the age of the patient.

This instrument was designed about eight years ago. I am informed that it is the one most generally used in the two chief throat hospitals, as well as in many of the special clinics of the general hospitals. It is manufactured by Messrs. Mayer & Meltzer, 171 Great Portland street, London, W., England, who report that they sell more of this model than of any other. It has therefore had an extensive trial before I ventured to bring it before the profession.

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## POST-NASAL FORCEPS.

BY ST. CLAIR THOMSON, M.D., LONDON.

The usual Loewenberg forceps and many of the modifications, measure 11 to 12 inches in a straight line from one extremity to the other. The examination of a few skulls and moist sections show that this is unnecessarily long. The instrument here represented only measures  $6\frac{1}{4}$  inches from tip to handle. With the patient's mouth wide open, as it must be in all cases requiring this instrument, this length is sufficient, even for full grown adults, while the shortness and lightness of the forceps lend precision to all manipulations in the post-nasal space. The forceps is otherwise but a slight modification of the form known as Jurasz's. It was designed some ten years ago, and at first was employed in all cases of removal of naso-pharyngeal adenoids. Since adopting the curette described



above this use of the forceps has been almost entirely abandoned. But it is still, owing to its small bulk, better adapted than the smaller curette for removing adenoid growths from infants, in whom the post-nasal space is both relatively and absolutely so remarkably small. In all adenoid operations it will also prove useful to have these forceps at hand for grasping any detached mass which may fall out of the caged curette, or for removing any tags of growth found hanging after the operation. Apart from the adenoid operation, these forceps are frequently of service in removing polypi or cysts from the choanae, and in dealing with foreign bodies, necrosis, and new growths in the post-nasal space. As they serve as carriers of cotton, wool or gauze, they are convenient for making applications and dressings, or for tamponing the cavity. They are made in one size only, by Messrs. Mayer & Meltzer.

## **SOCIETY PROCEEDINGS.**

### **NEW YORK ACADEMY OF MEDICINE.**

#### **SECTION ON LARYNGOLOGY AND RHINOLOGY.**

*Stated Meeting, February 22, 1905.*

LEWIS A. COFFIN, M.D., Chairman.

#### **PRESENTATION OF CASES.**

##### **Nasal Fibroma Treated by Injections of Monochloracetic Acid.**

By HARMON SMITH, M.D. (Published in full in *THE LARYNGOSCOPE*, Vol. XV., No. 4, page 292).

DR. HARRIS said that Dr. Smith was to be congratulated on the results obtained in this case, as his own experience in two cases had shown him how very difficult they were to handle. He had used Monochloracetic acid in the first case with the result that the tumor was reduced to a very considerable extent and the patient greatly improved, though the tumor did not entirely disappear. The second case, one of angio-fibroma, was treated by this method after various other methods had been tried unsuccessfully. In this case, however, a pronounced hemorrhage had followed a thorough injection of five minims of Monochloracetic acid. He thought this an additional and valuable method of treatment, where the cautery snare failed, for those conditions which, if taken early enough, can be treated through the nose.

##### **Peculiar Laryngeal Cough (Barking) in a Young Girl:**

DR. GEORGE B. MCAULIFFE presented the patient, who was brought in suffering from a severe attack of the cough, which attracted considerable interest. Dr. McAuliffe stated that the only thing which he had found to check these spells was an adrenalin spray. The case seemed to him to be a unique one. The girl seemed to be of a somewhat nervous temperament, but otherwise perfectly well. On the 22nd of March, 1903, at 11 A. M., she began to cough in this way, and thereafter at the same time in the morning she had had these paroxysms. The cough at first was more of a bark than it is now. She gets worse when she is nervous, and does not cough when asleep. During the coughing spells her extremities get cold.

There is no secretion whatever. At first the only thing that relieved her was intralaryngeal electricity, given by her former attending surgeon, Dr. D. J. McDonald, but that method was abandoned on account of the long journey she had to make, coughing all the way, and the expense involved. When Dr. McAuliffe first saw the case he examined the larynx carefully for some local cause, but the only thing he could discover was a little redness over the arytenoids. He applied adrenalin to the arytenoids, and the cough immediately stopped, and since then she has been supplied with the spray, which she uses herself. Before this relief was obtained the girl was practically ostracised on account of the unpleasant attention attracted whenever she was taken with one of these spells. He had never before seen anything just like it, nor had others to whom he had spoken on the subject. She had been examined by neurologists, and practically every specialist, but no one had offered any suggestion for her relief, though the case doubtless belonged to the class of hysteria. The character of the cough is laryngo-buccal.

## DISCUSSION.

DR. McDONALD said that he had seen the case several months ago, and first tried a large amount of current of a low voltage. This stopped it at once, but in a week she returned and had another spell. Another treatment stopped it for three and one-half months. The character of the cough now and when he first saw her was entirely different. She had not then the strident character and puffing of the mouth, which is now so marked. He was inclined to think she had better be placed in the hands of a gynaecologist.

DR. QUINLAN inquired whether cocaine had been tried, and upon receiving the reply that it had, he said that some four years ago he had seen a case, not so marked as this, but evidently of a reflex type. Dr. Starr was asked to see the case, and suggested the use of cocaine through the nostrils, and the result was remarkable. When the cough started, if she would simply place a pledget of cotton with a 10% solution of cocaine in the nostril it would stop instantly. He was afraid, however, to encourage her in the use of cocaine for fear she would become addicted to its use.

DR. DOUGLASS said that he had relieved this case by simply pressing on the tip of the tongue. He did not think this should be called a cough; it was more of an hysterical bellow, the sound being produced altogether in the mouth and not in the larynx at all. He thought that the case was undoubtedly hysterical.

DR. SIMPSON said that he thought that Dr. Hopkins, of Springfield, Mass., in reporting a similar case, had reached the conclusion that it was purely spasmodic and overcame it by intubation, using the tube for some time and thus preventing the spasms.

DR. McDONALD said that he also had tried passing the finger over the epiglottis; but the girl had had such a violent spasm that she nearly fainted. Indeed, he thought he had tried everything in the category of medicine, but outside of galvanism he had found nothing that did any good.

DR. McAULIFFE said that supra-renal extract was the only thing he found of any avail. Thinking that the effect of adrenalin might be that of suggestion he had used water, cocaine, astringents, but none had any effect. When the attacks first came on he had tried keeping the mouth forcibly open, and when in this condition she could not cough, for in order to get the peculiar quality of cough the jaws must come somewhat together. There was a buccal character to the cough when the mouth was kept closed. The spasm seemed to spread from the larynx to the muscles of the mouth.

**A Case of Adeno-Carcinoma of Nose—Killian Operation for Radical Removal.** Presented by JOHN MCCOY, M.D. (Published in full in *THE LARYNGOSCOPE*, Vol. XV., No. 4, page 294).

#### DISCUSSION.

DR. SHARPE said that Dr. McCoy certainly was to be congratulated upon the result obtained, for it was hard to believe that a case with adenomatous tissue in the frontal and ethmoid sinuses could be operated upon with such success. He then told of a patient who had come under his observation at Bellevue about six years ago. The man was about 60 years of age and gave a history of having had some trouble during the war, when his face had swelled up very much, especially over the right antrum. This had disappeared entirely, however, and he had no further trouble until about seven years ago, when he was troubled with some difficulty in breathing, when a number of polypi were removed. He had been operated upon several times before he finally came to Bellevue. A small piece was removed and the pathologist reported it to be Adenoma. His nose was operated upon and a clear breathing space given him. In about a year's time he returned. A specimen was again removed, and this time it was reported to be Adeno-carcinoma. It had extended from the inferior turbinate into the antrum over the right



side of the ethmoid cells and frontal sinus, perforating the septum so that it could be seen on the left side. He had been relieved from time to time by operation, a knife and saw being used to clear out the nose through to the naso pharynx; but in five to six months he would return again with his nose all closed up. During the time he was being treated the x-ray came out. At this time he had not been able to see with his right eye for a year and a half and had a frog-shaped face. After three weeks' treatment with the x-ray the change was wonderful. The swelling and œdema disappeared, the eye opened so that he was again able to see on that side. This improvement lasted for about six months, but examination of the nose and pharynx showed that while the growth anteriorly was benefited, posteriorly it had increased in size. While he was using the x-ray treatment, the vault of the pharynx had filled up and the growth had extended back and grown on to the posterior portion of the middle turbinate. The speaker said that they simply continued to open up the nose with the knife and saw until he could not return any longer. He had lived for five years.

DR. MCCOY (closing) said that both Dr. Newcomb's and Dr. Hopkins' cases were included in the article of Dr. Cordes. Since then, he had only been able to find the one case mentioned, that of Dr. Page, though he had searched all available records very carefully. At the time of operation, a section of the growth was removed from the frontal sinus, and submitted to Dr. Williams, Pathologists at the Cancer Hospital; and he reported that the growth was undoubted carcinoma, and that it had rather more of the papillomatous arrangement here than of the acinous.

#### **A Case with Sub-glottic Growth.**

DR. McAULIFFE presented a patient with a sub-glottic growth whom he had seen that afternoon for the first time, and had brought around for suggestions in regard to diagnosis. Underneath the vocal cords and practically going around the entire larynx was a peculiar gray mass of some kind, the nature of which he had not yet been able to determine.

#### **DISCUSSION OF THE FORMS, PATHOLOGY, DIAGNOSIS, AND TREATMENT OF NON-MALIGNANT GROWTHS OF THE LARYNX.**

#### **Benign Neoplasms of the Larynx.** By CHAS. H. KNIGHT, M.D.

In the narrow field to which our Chairman has been fit to limit me in this discussion, I have found it somewhat difficult to gather material for a lengthy paper, for which you will be duly thankful.

There are certain general considerations applying to all laryngeal neoplasms which may be reviewed with profit. Many branches of the subject, especially those relating to treatment, are open to debate, but on at least one point there is universal agreement—papillomata far exceed in frequency all other growths combined. Certain other varieties are so rare as to be clinical curiosities. The preponderance of papillomata is probably to be explained by the richness in papillae of the laryngeal mucosa.

They are almost invariably multiple, and may present as scattered warty growths, dark red in color, generally attached to a vocal band, or they may be massed in groups of villous, tuftlike, or cauliflower outgrowths, greyish white in color, at almost any part of the laryngeal cavity. Sometimes the landmarks are quite obscured by their profusion, and life is actually menaced by the obstruction they offer to breathing. Genuine fibromata rank next to papillomata numerically. They are usually solitary, attached to a vocal band, and they seldom attain very large size. Cartilaginous tumors are much less frequent. They grow from one of the laryngeal cartilages, generally the cricoid, and hence are properly called ecchondroses rather than enchondromata. Pure myxoma of the larynx is extremely rare, and has been met with as a well defined tumor and in the form of a diffuse degeneration of the mucous membrane. Blood vessels which might develop angioma are small and comparatively few in the larynx. A characteristic vascular, lobulated appearance might be expected in these neoplasms, yet we read of cases in which these features were absent. Both color and contour may vary widely. Glandular tissue which might form an adenoma or a cystoma is relatively scanty, and for many years the presence of mucous glands on the vocal bands themselves was denied. The epiglottis is the favorite site of cysts. Of fatty tumors, less than a dozen authentic records can be found. Tumors composed of colloid tissue, of thyroid tissue, and lymphomata are mentioned among the possibilities, but their recognition *in situ* would be, to say the least, difficult. Admixtures of these various tissues are met with. For example, a soft edematous fibroma may closely resemble a myxoma. Certain fibromata are found to be quite vascular, while ordinarily they are not. Again, the proportion of fibrous tissue in some papillomata gives them a very hard, dense, compact character, whereas the majority of papillomata are soft, friable and fimbriated.

The differential diagnosis in typical cases is free from difficulty, but we all meet with new growths, about the character of which we do not feel justified in pronouncing a positive opinion, and an appeal to the microscope must be made.

In distinction from malignant disease, benign growths are superficial and proliferating, rather than deep and infiltrating. Consequently, as a rule, it is easy to get an ample microscopic specimen, and results are unequivocal. The uncertainty so often attending suspected malignancy is happily uncommon.

The disturbance created by a new growth depends upon its size and site, especially the latter. A small tumor on the margin of a vocal band may impair phonation with results varying from slight hoarseness to complete aphonia; whereas an outgrowth from the ventricle of the larynx may reach considerable dimensions before it is betrayed by marked functional derangement. Actual pain is never present, and hemorrhage points to exceptional vascularity (angioma) or suggests malignancy. It is a curious fact that cough is not a prominent symptom of benign laryngeal neoplasms, probably in consequence of the fact that in their slow development the surrounding parts gradually become accustomed to them. The statement that benign disease is most often seen in the anterior and malignant in the posterior region of the larynx, is not accepted by all authorities.

In taking up the subject of etiology we are confronted by a perplexing problem. Voice strain, the abuse of alcohol and tobacco, irritants in the atmosphere, the exanthemata, catarrhal conditions and nasal stenosis are all enumerated as possible causes; but these lose some of their weight as factors in view of the occasional occurrence of laryngeal growths in the new born and in deaf mutes, as well as of the enormous prevalence of these conditions without neoplastic developments within the larynx. A striking difference of opinion exists on this question. For example, Lennox Browne believes that adenoids in the vault of the pharynx are a common cause of laryngeal neoplasm, while Shurly affirms that he has never seen a new growth of the larynx in a subject of adenoids. Constitutional disease, especially syphilis, and a so-called "verrucous or polypoid diathesis," are usually included among the predisponents. The well-known prevalence of laryngeal neoplasms in France has been attributed by some to the national habit of speaking a *haute voix*, as well as to a predilection for after dinner liqueurs and cognac.

It would certainly seem reasonable to suppose that any condition diverting the inspiratory current from the nose to the mouth, or any marked abnormality of the mucous membrane of the upper air tract must predispose to structural changes in the larynx.

Bearing upon this matter, and in confirmation of the view expressed, let me recall a case of some interest referred to elsewhere. It also exemplifies a curious premonitory symptom not often noted.

A young college athlete came to me several years ago with multiple papilloma of his larynx. He was in the habit of engaging in running contests; and he said that, after a severe competition many months before, he first noticed an extraordinary *sensation of heat* in the region of his larynx, accompanied by huskiness of the voice, lasting an hour or more. These phenomena were repeated after succeeding races, and were more decided and prolonged, until his voice became permanently hoarse and he was led to seek relief. He was found to have several papillomata at and below the anterior commissure, and, at the same time, his nasal passages were very narrow and obstructed by turbinate hypertrophies and a moderate deviation of the septum. In order to get air enough during violent exercise, he was obliged to breathe through the open mouth; and most of the time, nasal breathing was far from satisfactory. It is beyond human power to explain why many another larynx exposed to far greater stress escapes disaster, or to say whether this one might not have suffered even in the absence of the peculiar conditions held responsible. It may be necessary to suppose some structural weakness or lack of resistance in the tissues themselves rendering them particularly vulnerable.

It is customary to tabulate the records as to the relative frequency of new growths of the larynx, in the sexes, and at different ages, the situation they select, and various other data. Such statistics may be of more or less interest, but are of doubtful value.

Many years ago, one of my good friends asked me to his clinic to see a case in which Voltolini's sponge had succeeded in removing a laryngeal neoplasm. Seated in the chair was an old rascal more than sixty years of age, from whose larynx several weeks before, at my Manhattan clinic, I had removed with Mackenzie's forceps a fibroma of the vocal band. In spite of my certain recognition, he persistently denied his identity. He afterwards confessed that he did so to spare our feelings. His regard for the integrity of the statistics of the Voltolini sponge method was probably less keen; and, but for our accidental meeting, he would have gone down to history in a double role, a case of fibroma of the larynx accredited as a cure in one to Mackenzie's forceps, and in the other to Voltolini's sponge. The episode illustrates the risks attending the statistical method of gaining information. To be worthy of acceptance, statistics must be complete, carefully compiled, and well sifted. These qualities are notably true of the collective investigation by Semon as to malignant degeneration of benign growths. Although such a change might be thought quite possible, his figures show that it occurs but seldom, if ever, and their great practical benefit lies

in the fact that they encourage us to proceed with endolaryngeal manipulations in suitable cases without fear of exciting malignancy. As a matter of fact, the transformation has been observed more often in cases that have not been disturbed than in those subjected to repeated operation. In spite of the conclusive evidence thus given, it seems impossible to overcome the ancient prejudice regarding the danger of malignant change resulting from prolonged local irritation.

A relation between papilloma of the larynx and tubercular disease has been suggested. We must distinguish true papilloma from those granulating excrescences so commonly seen projecting from the posterior commissure of a tuberculous larynx. The latter are in no sense neoplasms. It is possible that a mass of fungous papilloma may be a nidus favorable to the cultivation of tubercle bacilli, but as yet we have no testimony in support of a belief that the tubercular granulations are especially prone to the formation of laryngeal papilloma.

There is no doubt that cases of benign laryngeal neoplasm are less numerous than formerly. This fact, combined with a neglect of the larynx due to the overwhelming attention given to nasal and pharyngeal pathology, threatens to eclipse the "tactus eruditus" of our fathers.

Instances of spontaneous disappearance, at least of the less highly organized varieties of new growth, are not unknown, yet few of us would contentedly wait that uncertain event. Nor should we be inclined to accept the dogmatic assertion of Lennox Browne to the effect that the majority of these growths are innocuous and had better be let alone. Undoubtedly papillomata show a most discouraging propensity to relapse, yet such a sweeping assertion as the foregoing seems hardly justified in view of the present state of laryngeal surgery. It reminds us of the belief of Rühle, in pre-laryngoscopic times, that the nature of a laryngeal tumor, innocent or malignant, is immaterial, the management of all kinds being equally disappointing.

We look back upon the achievements of Fauvel, of Mackenzie, and of other masters of our art before the days of cocaine, with profound admiration. Even to-day, with the benefit of their experience, with the invaluable aid of local anaesthesia, and with all the resources of modern technique at our command, there are but few manipulations requiring the skill, ingenuity, and patience demanded in ablation of a laryngeal tumor. It may be added that there is none, the successful outcome of which justifies an equal degree of pride and satisfaction.

DR. C. C. RICE said that benign laryngeal growths of all varieties were less frequently seen to-day than they were ten or fifteen years ago. He himself did not see nearly so many cases as formerly, and he believed it to be a fact that such growths were diminishing in frequency. He was inclined to attribute this to the improvement in the use of the speaking voice and to the greater attention paid to the hygienic treatment of nose and throat conditions at the present time than prevailed some years since. There is no question but that the "Awful American Voice," of which we have known so much, is not so common now as it used to be. This high-pitched screaming voice was certainly a fruitful cause of laryngeal irritation, resulting often in thickening, and in fibromata or papillomata. To-day catarrhs of the larynx are held in abeyance, because nasal diseases are much better taken care of. He had lately seen a case of fibromata of the vocal cord due to a very severe catarrh of the larynx, secondary to a post nasal and nasal catarrh. The patient was an actor who was playing every night. He had a tremendous amount of laryngeal congestion; and, in the strain and stress of the nightly exercise, one could almost see the daily development of the growth. After three or four months a large growth was present. The speaker said that he slipped a guillotine over the growth; but failed to remove it promptly, owing to the dullness of the instrument. The patient being very irritable, left without allowing another attempt to remove the growth. A few days later he reported that his voice was wonderfully better, and I found that the growth had sloughed off where it had been incised with the guillotine.

The speaker said that the fibromata, being essentially inflammatory growths and akin to the "singer's nodule," were probably produced by traumatism, that is, by abuse of the voice, just as singer's nodules were. As to treatment, the whole matter resolved itself into a question of the skill of the operator. A man who would attempt to remove such growths without injuring the vocal cords must be an expert laryngologist, and he should be particularly expert on the day when such removal was made. All men have their good and their bad days, and the man was fortunate who got only an easy case when he was not at his best. The cases differ tremendously. Public speakers, singers, and professional people generally were much more difficult to treat, as a rule, than non-professional people. In the speaker's own experience, those who used their voices only in the ordinary way were much easier to treat than public people, because they were less nervous generally, and the larynx was less irritable. Much depended upon the individual character of the larynx and epiglottis. A nervous and irritable patient made



operation very difficult. The speaker thought that the preliminary treatment to which Dr. Delavan had alluded was very important, and a physician injured his chances of success by frightening the patient about the growth. Of course, the patient must be informed as to the true character of the condition, but the very word growth or tumor is so frightening a thing that as soon as patients hear it they behave in a manner which renders the operative treatment difficult. Whenever possible, several days should be spent in educating the patient—give bromide of sodium, accustom the larynx to the feeling of the mirror and the manipulations necessary—and he will behave much better than a frightened patient who is visiting the physician for the first time.

In regard to the use of cocaine, he was in the habit of spraying a 4% solution of cocaine until the larynx was quiet, and then applying a 10% solution with an applicator until the growth could be touched without producing spasm. He could then use the forceps, snap-guillotine, laryngeal scissors, or whatever instrument seemed best adapted to the case. Forceps were not always properly made. The stores are stocked with forceps and other instruments with which it is impossible to reach the vocal cords. Forceps should be bent downwards three or four inches and at right angles, and they should be of very light calibre. A thick pair of forceps obstructs the view. A slender pair of forceps, with its downward portion somewhat bent upon itself, enables the growth to be seen very well.

Chromic acid with a hooded applicator may be usefully applied to small growths and to the surface after a tumor has been removed by forceps or guillotine. The electric cautery is difficult of application and dangerous in any hands except the most expert. He did not care to discuss the comparative merits of different instruments. Some growths were so large that nothing but forceps should be attempted. He himself preferred the snap-guillotine wherever the growth was of the proper size. Of course no one would think of first using the galvano-cautery or chromic acid on large growths, but would first try some variety of forceps or guillotine. Much harm could be done by badly applied cautery or chromic acid, and yet the vocal cords show a tremendous ability to recover from bad injury. He had never seen a case that he thought was benign, degenerate into a malignant growth.

DR. W. K. SIMPSON, New York, spoke as follows: It goes without saying that the greatest desideratum in the diagnosis of non-malignant laryngeal growths should be the ability to decide upon their character, as far as possible, by means of external appear-

ances as revealed in the laryngeal mirror. I do not wish to belittle in any sense whatever the great assistance of other diagnostic points, as for instance, the relation of the age of the patient, or the value of the microscope. The first, often is only suggestive and problematical, by no means always decisive; and the microscopic, though positive in most instances, cannot be always absolute. True it is, that all laryngeal growths occurring in the malignant time of life, viz., after forty-five years, should be viewed with suspicion. Still the largest single mass of non-malignant tumors that has ever fallen to my care was in a patient of 63, who made a complete recovery without recurrence, when it seemed from their appearance that they were malignant. Frequently, the growths are so small or so situated that a suitable amount of tissue for full examination by the microscope cannot be obtained.

As a valuable aid in the examination of the interior of the larynx, I should like to mention the concave laryngeal mirror which gives a materially magnified image of the parts. In my hands it has been invaluable in settling many questions as to the extent of the lesion, character of surface of growth, and many other finer decisive points, which I am sure could not have been determined by the ordinary flat mirror. It requires a little practice in its use, mainly in focusing with the head mirror, but after a little while, when one becomes accustomed to its use, and its first effects of distortion, its value becomes daily enhanced. Possibly it is familiar to you all; but nevertheless, I take this opportunity of mentioning it and passing it around for inspection.

Inasmuch as the major portion of non-malignant intra-laryngeal growths are papillomatous in character, I will confine my remarks on treatment to that character of tumor. As we well know, they may be single, multiple, large, or small, with pedicle, or sessile; and a due appreciation of these points will determine the line of treatment. I am positive in my belief that the best treatment is removal with laryngeal forceps as in contrast with other attempts by means of caustics or the alcohol spray. Of the alcohol spray, I can only say that while possibly useful in some hands, it has been an absolute failure with myself; and I think I have given it a good trial. With our present knowledge of cocaine and adrenalin, we have at our command ample means for placing the larynx in condition for easy intra-laryngeal operation, with a minimum of pain and hemorrhage, the ultimate results depending upon the skill of the operator. I think that better results are obtained and much time is saved by the combined use of cocaine and adrenaline in the one solution. The immediate blanching of the intra-laryngeal mucous

membrane by the adrenaline is a valuable indication of the entry of the solution into the larynx. Another advantage of the combined use of cocaine and adrenaline is that undoubtedly it prevents in a great measure, the poisonous constitutional effects of cocaine. It might be well to mention a precaution. We are very liable to use adrenaline quite freely and in a strong solution, 1-1000, and in its use in this particular locality a certain amount will reach the stomach in the act of swallowing. I have found when used on an empty stomach, violent paroxysmal gastric pains, with vomiting, have followed in a number of cases, in about a half hour. This has happened only in those patients whom I have treated at the close of the morning or evening hour, just before meal time. So I would suggest that when a considerable amount of adrenaline is to be used in the lower throat, it should be done when the stomach is reasonably full, or that the patient should be urged to eat something directly after the operation.

The details of preparing the larynx for intra-laryngeal operation will undoubtedly vary with each of us according to our experience, but I would like to mention again the value of the long downward pointed laryngeal atomizing tube, which I think I have shown before. With this type of atomizer guided by the laryngeal mirror, one can easily direct the atomizing solution well within the larynx and thus prevent the distribution of the solution over all the parts leading down to the larynx.

The instrument which seems to me to be best adapted to the removal of laryngeal papillomata, whether with pedicle or sessile, whether isolated or multiple, is the Schroeter tube forceps, with the pistol handle, and with the tube as small as possible and so bent that the operating hand is out of the way, thus giving a clear field of vision while the instrument is in the larynx. The ends may be adjusted to meet either a lateral, anterior or posterior position of the growth. Care should be taken that, while being closed on the growth, the forceps are given a little downward motion so that they are not withdrawn from the growth as the blades are brought together. With this instrument, one can strip the entire lateral surface of a vocal cord by exerting a firm outward pressure within the larynx. To prevent a recurrence, I think it necessary, in most cases, especially where the growths are multiple or extensively adherent, to cauterize the site of the growth. The best cauterizing agent in my experience has been lactic acid, even in full strength. I think that it produces less reaction, does less damage by spreading, and apparently has a better destructive action on pathological tissue than the galvano-cautery or other chemical caustics.

A word as to the choice of the extra, or intra-laryngeal operation in the removal of the papillomata, especially in children. If a good examination can be made and the child is large enough to hold the larynx in view for operation, and the growths are definitely made out to be inter-cordal or supra-glottic, the intra-laryngeal operation may be attempted; but if we cannot determine the exact extent of the growth, or if the growths are infra-glottic, the extra-laryngeal operation is indicated. We should always bear in mind that in children there is a decided tendency to the extension of the growths into the infra-glottic and tracheal region; and again, we should always suspect in children, who give a history of progressive dyspnoea, with or without loss of voice, the presence of laryngeal papilloma.

DR. DOUGLASS said that the method of diagnosing by tracheoscopy or bronchoscopy had not been touched upon. He had been using these methods for the past few weeks and found it an extremely useful procedure for determining the limits of growth. He thought it would prove to be a very valuable method of diagnosis in the sub-glottic regions.

DR. HARRIS said that he would like to call attention to two valuable papers read before the Section on Laryngology of the British Medical Association last August by Dr. Dundas Grant and Prof. Rosenberg of Berlin. In Dr. Grant's paper, reference was made to a paper on a similar subject by Dr. Chiari, who classes all laryngeal growths of a benign nature, papillomata, fibromata, etc., as simply manifestations of chronic laryngitis. In reference to frequency, some statistics by Massei may be of interest. In 500 cases of benign growths of the larynx, he found 183 papillomata and 156 fibromata—not much difference in the two. In the statistics of Semon in reference to malignancy, he found that one case in 211 became malignant without operation, and one case in 249 after operation had been performed—a small margin for cases after operation. In regard to the question of complete rest and the possibility of cure, Dr. Grant refers to the case of a man who had a pronounced aphonia where all papillomata disappeared on complete cessation of the use of the voice. He also obtained very excellent results from the use of 1-2% solution of salicylic acid, locally, following operation to remove the stump remaining. The speaker also referred to the very satisfactory results he had obtained with the Dundas Grant safety forceps, an instrument well-known to most of the gentlemen present, but which he took the liberty of presenting. It is admir-

ably adapted to cases of overhanging epiglottis, or where the growth is a sessile one.

DR. QUINLAN said that some years ago he presented a paper before the Section in which he spoke of nasal and post-nasal irritation as a factor in laryngeal neoplasms, and he was glad to-night to find that the rhinologists had again fortified themselves by the judgment of the men who have spoken of the laryngeal strain and of the loss of resonance in a voice having a post-nasal obstruction. Secretion frequently falling over those parts, readily causes infection, if they are inflamed. It was certainly very satisfactory to have it recognized that the rhinologist has diminished laryngeal conditions. These certainly are comparatively rare as compared with ten or twelve years ago, and he agreed with Dr. Rice, that much of this is due to the change that has been produced in people treated for faulty conditions of the nose and the relief given to the upper part of the respiratory tract. He rejoiced in this turn of affairs as a move taken in the proper direction, and hoped that the words which had been spoken on this subject would find an echo in the heart of every laryngologist.

DR. SIMPSON said that whether or not nasal and post-nasal conditions constituted an important factor in these growths, there was no doubt that the sudden and undue use of the voice constituted an important factor. He had seen cases where no other cause could be assigned than an undue sudden straining of the voice. Of course the question might be asked, as Dr. Knight has suggested, why does this not always produce trouble? Is there not another factor to be considered? It might be that the individual affected was not up to the usual standard of health. He might be tuberculous, or below the standard in some other direction.

#### PRESENTATION OF INSTRUMENTS.

##### **Chair for Rhinologists and Laryngologists:**

Dr. Wallace showed a chair which had been made after his design by Meyrowitz, of this city. It consisted of a good, steady, straight backed chair, with a head rest which could be readily adjusted to the height of the patient's neck, and pushed backward or forward to fit the position required. When not needed it could be easily pushed out of the way, and did not interfere with the use of the chair for ordinary work. Another feature was the hand-grips attached to the sides of the seat for the use of patients who wanted something "to hold on to." These grips were very handy

and were never in the way, as the arms of a chair would be, when turning patient to examine the ear, and they were in a natural position to be seized by the patient.

**Nasal Septometer :**

Dr. Wallace also showed a nasal septometer, and explained how the angle of the handle, and the places for the finger and thumb, facilitated the taking of the reading from a vertical end scale without change of the position of operator or of the instrument. This eliminates the chief objections to the original Seiler Septometer, of which Dr. Wallace's is a modification.

**Revolving Knife for Sub-mucous Resection of the Septum :**

Dr. Herbert E. Smyth showed this knife, and explained that it was designed to cut in any direction, thereby avoiding the necessity of changing knives during the operation. The operation was to be performed as in the ordinary "window resection" of the cartilaginous septum, the convex mucous membrane and perichondrium dissected back out of the way, the cartilage perforated, and the concave mucous membrane and perichondrium separated from it without rupture. The revolving knife is then introduced through the perforation into the space between the concave cartilage and separated mucous membrane and the deflected cartilage removed in any size or shape desired.

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*Stated Meeting, March 17th, 1905.*

DEVOTED TO THE CELEBRATION OF THE ONE HUNDREDTH BIRTHDAY  
OF SIGNOR MANUEL GARCIA.

L. A. COFFIN, M.D., Chairman.

DR. DELAVAN read a letter of congratulation to Signor Manuel Garcia, which had been sent by Dr. Harmon Smith, who was attending the meeting held in London, as Representative of the Section on Laryngology of the New York Academy of Medicine.

NEW YORK, March 7, 1905.

*Signor Manuel Garcia:*

As representatives of the Section in Laryngology of the Academy of Medicine of New York, the oldest Laryngological Society in the world (1873), we send to you its cordial greetings, its warm congratulations, and its earnest wishes for your long continued happiness and good health.



Your name, a household word in Europe, is not less known to us. The professional career of yourself and your illustrious family is, with us, a cherished tradition.

The fame of your invention is far and wide exploited through our land by more than half a thousand well trained specialists, while many hundreds more have gained fair mastery of its use. In our one city of New York alone, full thirty institutions, owing to your gift, have well equipped departments where almost countless thousands seek and gain relief.

New York, the home of Horace Green, joins with America and with the other nations of the world in testifying to the mighty debt which your great work has placed upon humanity, and offers you as the tribute of its love, its gratitude, its praise.

(Signed)

D. BRYSON DELAVAN,  
CHARLES H. KNIGHT,  
JONATHAN WRIGHT.

**Manuel Garcia, Teacher, Discoverer, and Man.** By JAMES E. NEWCOMB, M.D.

DR. COFFIN announced that it had been the intention to have an address by Walter Damrosch, but at the last moment Mr. Damrosch had found it impossible to come. He had, however, been fortunate in securing the presence of an intimate friend and associate of Signor Garcia's, Mr. Herman Klein, a distinguished music teacher, and took pleasure in introducing him to the Section.

MR. HERMAN KLEIN said that the invitation to address the Section being entirely unexpected, he had not had time to prepare an address, and therefore felt somewhat at a disadvantage in speaking, after the eloquent words of the preceding speaker. He wished, however, to congratulate him upon the absolute truthfulness of all his remarks, and the appreciation which they had shown of the character of Manuel Garcia. He also felt at a disadvantage in replacing so distinguished a musician as Mr. Walter Damrosch, but that he had one advantage over both these gentlemen in having been a pupil of Garcia and his friend for thirty-one years. In 1874 he was engaged in business in Liverpool, with no idea of a musical career, when he received a request from his parents that he would return to London and for professional reasons join them there. The house which his parents had taken was larger than they required, and they had rented the ground floor to an eminent teacher of singing, whose name, of course, was known to him. That teacher of singing was Manuel Garcia. He received his pupils and taught in this

house for upwards of nine years, and Mr. Klein was brought into daily and intimate contact with him, a very great privilege, and one which he felt he appreciated then nearly as much as he did to-night, though to-night there was a feeling of added happiness and pride. His father was not a great believer in longevity, but one day he had spoken of Garcia as a man who would live to be one hundred and fifty. That showed he was at any rate a great believer in Garcia's capacity for living, and the speaker said he thought the reason for this was that although Garcia was then seventy years old, he was the most energetic, lively, vigorous, quick-moving and quick-speaking man he ever knew. He has had the ordinary share of man's cares, and has had more than the ordinary share of man's hard work, but nothing has ever occurred to disturb his equilibrium or the regularity of his living; or, if it has, he has never shown it. He was always a man much younger than his years, and it was difficult to realize in those days that his elder sister, the great Malibran, had been dead for exactly as long a period as the speaker's mother had been living, for the latter was born in 1836, the year that Malibran died. He was a great teacher even in his earlier days. He had a marvellous faculty for discovering the nature of a voice and training it in such a way that it progressed like the growth of a tree, the trunk carefully trained to grow toward the sun, spreading its branches in due proportion, and the roots growing long and strong beneath the surface of the earth, thus producing a perfect plant. The teacher of singing, as a rule, is anxious to do more than is really necessary, and wants to decide at once whether the singer is a soprano, mezzo-soprano, contralto, or what not. But Garcia never troubled himself about that. He thought of the middle portion of the voice, and that as the tree must develop from its trunk, so must the voice develop from its medium tone. Mr. Klein described the working of the vocal cords, and explained that which could not have been known without the aid of the laryngoscope, that when the inner edges vibrate they produce the falsetto or medium voice; and that therefore that is the part of the voice which, when carefully employed, suffers least from strain, gives the truest quality, and the most beautiful and sympathetic quality, and should be the point from which to start the growth of the voice. At the time the speaker first knew him, Garcia was working with all the knowledge that the laryngoscope had brought him; but he had been a thorough master of the art of teaching on the pure Italian system which was one of more or less natural results brought about by natural effects, long before the discovery which has proved so valuable to science. Mr. Klein had never seen Garcia use the laryngo-

scope, although he had seen him teach a great many students. He never thought it worth while to teach by means of technical or physiological expressions. His great idea was, as far as possible, to keep the mind of the pupil clear and free from any technical expressions which were calculated to confuse the mind of the student, and this was no doubt the manner of the great Italian masters before him. It should be remembered that Garcia, who knew and knows everything worth knowing about the human throat, with all his technical ability, was content to teach by the old process without the assistance of more artificial resources.

In his modest way, Garcia was fully aware of the value of his invention, and knew what was being done with its aid. He knew that it was not alone for the purpose of singing that a great Providence had enabled him to discover it, and he did not regard it as an essential for teaching singing. For other technical studies, apart from the laryngoscope, he had a very cleverly constructed model of the human throat which he had brought from Paris. This enabled students to see what the interior of the throat was like, but beyond that, Garcia confined himself to the model of his own voice and to instructions as to the manner of using it. He was, therefore, proud that this great year should be recognized as it was in such exalted quarters. He certainly regarded his discovery as of greater value from the medical or scientific standpoint than from that of the teacher.

The speaker expressed great approval of a little book by an eminent music teacher in Berlin, who seemed to thoroughly understand the wonderful teaching of Manuel Garcia from the technical point of view. A very interesting point was one for which Manuel Garcia was alone responsible. As the result of his observations with the laryngoscope, he was able to describe for the first time the exact manner in which the vocal cords acted in the attack of a vocal sound. Being in France at the time, he gave this the name of the "*coup de la glotte*" (the stroke of the glottis). In a book published later he mentioned this *coup de la glotte*, taught it, explained it, and demonstrated it. As long as he did this himself, it was all right, but in the course of years there grew up a generation of teachers who, having read what Garcia taught, brought out their own text-books also, and they began to teach the "*coup de la glotte*" according to their ideas. The result was that sooner or later the phrase assumed a wholly strained and incorrect meaning. The speaker told how Madame Melba had expressed to him her surprise that he believed in the *coup de la glotte*. "What," she said, "you believe

in that terrible thing, the *coup de la glotte*, and that it is the way people attack their notes?" That was the idea she had formed of Garcia's term, and it was the idea that to some extent prevailed to-day in Paris; but the manner in which Manuel Garcia himself described it was that it was the simple first explosion of the sound produced by the voice, the stroke of the glottis in the act of emitting the vocal sound. The two ideas were as far apart as the poles.

Some eleven or twelve years ago, a lecture was delivered at the Lyceum Theatre in London by the famous baritone, M. Maurel, who claimed to have discovered the true art of singing, as no one else had known it before. Incidentally he violently assailed the *coup de la glotte*. Of course his view was the wrong one, but for some time the term had been in disgrace, for hundreds of teachers had taught it so badly that it had become discredited. With some persuasion the speaker had induced Garcia, who was present at the lecture, to write a letter to the Sunday Times categorically denying M. Maurel's statements, and making the true meaning of the term perfectly plain. Nevertheless, the false impression still persisted.

With regard to his own studies with the famous teacher, Mr. Klein said he had no time to relate reminiscences. He would only say that Garcia was the most perfect master of every branch of his work that could be imagined. His wonderful powers of observation, his patience, his marvellous appreciation of the capacity of the organ, and his ability to exactly train it within its true limits, and no further, had never been surpassed by any other teacher, and yet to all appearance, no man was ever so completely unaware of the greatness of his work. In 1841, sixty-four years ago, the great singer, Jenny Lind, came to him in Paris with a voice completely shattered by bad training and over-exertion. She showed that she had had a beautiful voice, but nearly everything in its management was faulty; the registers were wrong and she could not even make a shake. Between August, 1841, and July, 1842, she studied with the great teacher, and he completely renovated her voice; and, thanks, of course, to the natural strength and beauty of the organ, he turned out the Jenny Lind who was the vocal marvel of her time.

The speaker closed by expressing again his appreciation of the privilege of being present at this gathering, held in honor of his great master. He felt like a stranger far away from his native land, who yet on some great festive occasion could enjoy being in the midst of those who were thinking and feeling as he did. He was very proud of having been able to address the meeting, and would not fail when he again saw Manuel Garcia to tell him the story

of that evening, and he would like in advance to offer the Section Senor Garcia's thanks for the compliment they rendered him, for he would assuredly value it no less than the honors which had been bestowed upon him in London at the same time.

**Paper: The Future of the Laryngoscope and the Study of Laryngoscopy.** By JOHN N. MACKENZIE, M.D., Baltimore.

Dr. McKenzie paid a graceful tribute to the great man whose hundredth birthday the laryngologists of the Old and New Worlds to-day unite in honoring; and, then passing on to the subject of his address, he made a strong plea for the more thorough study of laryngology as a compulsory part of under-graduate medical instruction. It was not until 1893, and then only in one institution, that it was made one of the required branches of study for the degree of M.D., and notwithstanding its importance and value to the diagnostician and general practitioner, it is not yet by any means universally regarded as an obligatory study. The time, however, is fast approaching when the use of the laryngoscope will be considered as necessary to the well-equipped physician as the stethoscope in the examination of the chest. The time is not so long past when the physical diagnosis of the chest was not considered a requisite in the under-graduate course. All the departments of medicine are mutually dependent, and if this is impressed upon the student early in his course, it will follow him in all after studies in special departments as an abiding stimulus.

Dr. Mackenzie gave an interesting account of the crude methods of teaching which prevailed when he was on the working staff of a London Hospital some twenty-four years ago, and later when he took charge of this department of instruction at Johns Hopkins University in 1889. In 1893 the course of Laryngology there was firmly organized and made an obligatory study for the under-graduate, and thus Johns Hopkins University is the first institution in this country to give this department of medical science the prominent place which it deserves. Dr. Mackenzie closed his address by giving a rather full description of the requirements and methods pursued in the course of Laryngology at Johns Hopkins to-day.

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AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND  
OTOLOGICAL SOCIETY.

*Tenth Annual Meeting, Held in Chicago, Ill., May 30, 31, and June  
1, 1904.*

NORVAL H. PIERCE, M.D., *President.*

*(Continued from April No., page 334.)*

**Report of a Case of Chronic Purulent Otitis Media, Complicated by Chronic Mastoiditis and Jugular Bulb Thrombosis; Operation; Death.**—BR DR. JAS. F. MCKERNON, New York City, (*Published in full in THE LARYNGOSCOPE, Vol. XIV., No. 12, page 938.*)

DISCUSSION.

Dr. EDWARD B. DENCH agreed with the author that a good many of these cases ran an atypical course. He reported some time ago a case very much like the one narrated in which there was a low temperature. He had never seen a case of acute thrombosis with low temperature. He had seen cases in which the sinus had been exposed and obliterated as the result of a previous inflammatory process. Nature had looked after it and apparently he had to deal with an aseptic clot, with complete obstruction of the sinus. He had come across one or two cases in operating for acute mastoiditis.

One point which interested him concerned the advice given to patients with suppurative otitis media. He agreed with Dr. McKernon that, as a general rule, these cases must be operated on. There were certain exceptions, however, and he was afraid some had been a little too hasty in recommending immediate operation. He had in mind a case which came to him with an acute exacerbation of chronic suppurative otitis media. What was needed was to relieve the acute symptoms. He said to the patient that an operation was imperative for the relief of the chronic suppuration which had existed before. The patient's general condition was fair. Ten days after she came to him, with acute symptoms, he operated upon the chronic condition. The operation was absolutely successful. She was not on the operating table more than an hour and a half. The cavity was lined with epithelium and he felt perfectly safe. Within three days thereafter she died from pneumonia. He thought his judgment would have been a little better had he allowed her more time to recover from the acute attack rather than urged immediate operation. He thought it was dangerous to wait, and that was the reason he advised



immediate operation. This case illustrated in a striking manner how careful one must be not to urge too early operation.

There was another question that came up, namely, the age of the patient. He recalled a woman, 67 years of age, who had had suppurative otitis media ever since she was six years of age, and he had been rather strongly urged by the patient and relatives to operate. She had a good free opening in the tympanic vault, but the tympanic membrane was destroyed. There was free drainage of both the malleus and incus. In such a case his advice was to keep the ear clean and not operate unless acute symptoms developed, for the reason she probably would not live more than four score years, and if she had had this trouble for sixty years, she would certainly be able to go thirteen years more without any trouble. He might be wrong in his judgment, but to operate on every case of chronic otitis media because there was suppuration was unwise. He believed, however, the majority of cases should be operated on, and the only way a large proportion of them could be relieved was to do a radical operation, with entire destruction of the tympanic cavity, opening the mastoid antrum, middle ear and external canal, and lining it with skin. In people of fifty and sixty years of age, who had had this trouble for many, many years, and the discharge from the ear was not undermining their health, a good deal could be done for them by keeping their ears in a sanitary condition, and one might allow many of these patients to go as they were rather than subject them to an operation, which, although it was but slightly dangerous, possessed an element of danger just as any other operation.

Dr. FRANK ALLPORT said a very large majority of the cases of chronic otitis media ran a certain course for years, especially if subjected to good local treatment, and nothing very serious occurred in a large proportion of them. When one was called upon to advise as to what the patient should do, he was in a position to give the advice without any hesitation whatever to submit to an operation. Nevertheless, cases of this kind gave us an opportunity to present to ourselves and to our patients the consideration of the question as to what was the average course to pursue. What advice should be given in the vast majority of these cases? Dr. Dench's remarks were *apropos*. One had to be governed by the circumstances and conditions of the case. Perhaps there was scarcely a gentleman in this room who would not give some advice similar to that given by Dr. Dench to an aged person with regard to operating upon a quiescent chronic purulent otitis media. Nevertheless, at the present time the profession was steadily becoming more and more from year to year confronted with the problem of what could be done in these cases.

A very large majority of them were neither tympanic in their nature nor tubal. Most of these cases had their pathological supply from cavities that were back of the tympanum—the hiatus, antrum, and in many cases the cells themselves, although in the majority of cases he had operated on, the cells had not been very much involved. Provided trouble was there, and it was in most cases, it was known that it was beyond the reach of ordinary methods. We could not reach the aditus ad antrum and cells by the ordinary treatment, with syringing, cleaning, powdering, and drying, or even by the treatment that the president of this association (Dr. Norval H. Pierce) advocated in many cases of acute middle ear trouble—drainage treatment. We could not get at the trouble by this treatment. It was beyond our reach, and therefore, it seemed to him that in not advocating operative procedures in the average case, after the disease had run a reasonable length of time, six or eight months or more, under good treatment, and had not yielded, we were not pursuing the proper course. He considered it good advice to say to these patients in the vast majority of cases that they ought to submit to a radical operation. This was certainly the course that was advocated in all other fields of surgery. Not for one moment would a general surgeon allow necrosis or pathological tissue to exist in other portions of the body without advising its extirpation, and he did not see why otologists should go on treating these cases by syringing, cleaning, drying, etc., when it was known that such treatment could not possibly reach the real seat of the trouble. All realized that many of these cases were kept in a reasonably quiescent condition. Some remained healed for an indefinite length of time if there was good drainage, if there was no obstruction to drainage of the ear; but even then, if the pathological supply was situated in the mastoid portion of the temporal bone, in a position where it could not drain out, the conditions were such that ordinary treatment could not possibly reach them. While he did not believe in the wholesale advice that all of these patients should submit to operation, he thought the members of the profession should have the courage of their convictions, and they should advise in the vast majority of cases that these patients undergo a radical operation.

Dr. ROBT. C. MYLES said Dr. McKernon had presented the report of an interesting case, which was worth more than a hundred successful cases. The accessory sinuses and middle ear were always surprising the members of the profession. He had often asked otologists, but never received any answer, as to what percentage of middle ear suppurations were fatal. In what percentage of cases was it absolutely essential to carry out operative procedures? A

large percentage of these cases got well of themselves. What was the percentage of risk attending operation? As we advanced and became better acquainted with the anatomy of the mastoid process and surrounding parts, and as we became accustomed to removing these parts, liberating the confined pus and removing pathological conditions, operation was becoming more and more safe, and he thought the essential points in regard to operation were a thorough study of the anatomy and acquaintance with the method by which we removed the cortex and the parts that lay between the external surface and the part we were endeavoring to get at. He would admit that those who were extremely conservative were swindled out of many operations. But did it pay them? In the last few months he had treated some twelve or fifteen cases of otitis media, with the classical symptoms of involvement of the mastoid. Tenderness was complete. He resorted to incision of the membrana flaccida and drum membrane, there being a complete opening in nearly all of them. The patients recovered.

A short time ago a little girl was sent to him by her friends. He delayed her case a short time. Her rectal temperature was taken twice, and it never went above  $99\frac{1}{2}^{\circ}$ . A mastoid operation was performed ultimately, and the bone over the lateral sinus had become diseased. She had beginning sinus thrombosis; the membrane was inflamed. He removed the bone cavity over the affected area without destroying the periosteal attachment of the bone. She recovered. The point he made was that by waiting two or three days more he would have lost the patient, and it would have been better to have operated on the other patient than to have lost this one. If one did not enter the cranial cavity, he thought the results in these cases in ninety-nine out of a hundred would be good.

Dr. A. LOGAN TURNER said that when he asked Dr. McKernon in a conversation what was a chronic middle ear discharge, he did not mean to suggest for one moment that he was not justified in doing a complete radical operation in the case reported. Should a complete mastoid operation be done in cases which had only discharged for seven months? What was the time limit between a subacute and a true chronic otorrheal discharge? He would like to get an answer from men of the experience of Dr. McKernon in this work. He would himself say we were justified in allowing a case to discharge for a year before we were finally forced to do the Stacke-Schwartz operation. He was interested in this subject because of having had the case of a child under his care in whom there were no rigors, hardly any elevation of temperature, and he removed a portion of the jugular vein.

In regard to the remarks made by other gentlemen concerning the percentage of fatalities, this was always an interesting subject; also in regard to the age of the patients. Up to thirty years of age the intra-cranial complications were much more frequent, but after that age they were very much diminished. The older the patient became, the less the risk of these intra-cranial complications.

Dr. NORVAL H. PIERCE said that the vast majority of cases of jugular bulb thrombosis were not found in the chronic cases, but in the acute ones, say within the first two or three weeks of the beginning of the disease, and after that, within six months of the development of the process. In fact, it was rarely found in chronic suppurations of the middle ear.

Dr. McKERNON, in closing the discussion, said he had very little to add except to say that a low temperature did occur in jugular bulb thrombosis. The cases which he reported two years ago were watched from the onset of the disease; they were operated on, and a clot taken from the jugular bulb and sinus. The patients made good recoveries.

During the past year he had seen one case in his own practice, and one in the practice of a colleague, in which there was a continuous low temperature from the onset. There might have been a high temperature previous to the time the patients came under observation. But if so, that was the only elevation of temperature. The case was not watched before coming under his observation. While this was not at all the rule, he believed there were a number of them attended by low temperature. In his case the clot was well organized.

He had been misunderstood in regard to advocating operation on every case of purulent discharge from the middle ear. He did not. One of his rules was that when dead bone was present he would operate. He did not wish to be misunderstood in regard to that point. If one found on first examination, after he had cleansed the canal and middle ear, bringing to his aid the probe, diseased bone—he did not mean exposed bone, he believed it was the duty of the otologist in every instance to advise operation. He should lay the matter distinctly before the patient or family, and if they did not wish an operation performed, let them accept the responsibility of the future outcome of the case. If one simply said to them, this case might go on for years without giving much, if any, trouble, they would quote him always as saying that, and if the case should end fatally, he was blamed by the whole family, relatives and friends. He did not wish to be misunderstood in regard to that point. Only when dead bone was found present upon examination would he ad-

vocate operation. Under no circumstances would he advocate an operation simply for a purulent condition without dead bone being present.

There was another point referred to by Dr. Dench. If one found dead bone present upon first examination, he was very apt to find it present throughout treatment. There might be a covering over of the exposed bone, and one might find the necrotic process quite as distinct several months after the examination as when he first saw it. In the case reported drainage was poor. There was a large opening when the case was first seen for the tubal entrance in the middle ear, which subsequently became closed, but the opening on a level with the short process was still present. There was granulation tissue present, which protruded through the opening, and this was evidence of intra-tympanic caries in a case of continued suppuration.

If he understood Dr. Myles correctly, he spoke of the percentage of risk attending these operations. He did not think there were enough cases collected to give any definite data in regard to that. In a collection of something over four hundred and sixty cases of purulent disease of the middle ear, data which he collected himself, seven per cent of that number had intra-cranial complications.

Regarding Dr. Turner's question, as to what comprises a chronic condition of the middle ear, he would simply repeat what he stated in a paper read before the association last year; namely, given a case of purulent disease of the middle ear, with or without treatment, that had lasted six months, he should classify it under the chronic stage, and he thought one was justified in so doing.

Dr. Turner's remarks in reference to the number of intra-cranial complications which took place in these cases were true, the larger number of them occurring under thirty years of age. As these patients became older, their resistance was much better, as the cavity of the bone through which the disease had traveled was thicker and longer, and in some instances the virulent condition of the poison became somewhat eliminated before it reached that stage.

**Fourteen Cases of Chronic Multiple Sinusitis Operated Upon by Way of the Maxillary Route.**—By DR. T. PASSMORE BERENS, New York City. (*Published in full in THE LARYNGOSCOPE, Vol. XIV., No. 11, page 868.*)

#### DISCUSSION.

Dr. ROBERT C. MYLES said that no one hailed with greater pleasure and delight any progress in the treatment of diseases of the accessory sinuses than himself, and he had always tried for many years to do

radical work with conservatism. There were many things that occurred in this class of cases that astonished us some times. One of the most remarkable things was the relief of pressure upon the venous circulation from operations in these cases; that is, in the return of blood to the heart. In removing the median wall between the nose and antrum, he had noticed a marked improvement in the condition of the ethmoid and sphenoid sinuses. In the so-called polypoid state, by extensive exsection of this region, after operation there seemed to be a sympathy between the different parts. Frequently the frontal sinus was involved, and a radical operation over the antrum, removing the median wall, would cause the frontal sinus to get well. Why, he could not say. But there had been a remarkable improvement in the ethmoid and frontal sinuses without cutting out the ethmoid cells. Thorough removal of the ethmoid cells was a questionable procedure in his mind. He had never seen it done. The ethmoid cells were quite extensive; they extended up into the frontal sinus above the orbital cavity; they extended behind the orbit, posterior and external to the sphenoid cell. The expression "thorough removal" of the ethmoid cells was frequently used, and after having removed half a dozen there were many left. He did not think it would be considered safe to remove them all. If a number of them were removed it was sufficient.

He had never had the opportunity of studying these cases through the antral route before and after operation. He had removed the median wall of the antrum or a part of the inferior turbinal through the antral route. He had thought it well to remove whatever he desired through the nasal region, and he had not had the experience the author had had to form an opinion that would be worth much. He could not understand how the author could do with a sharp curette what he said he did. He had tried it often; he had curetted thoroughly parts of the ethmoid, and every time the curette would dangle about. It was slippery, and he had to use forceps or rongeur to remove the fragments. He had not been able to clear this field in the manner in which it was done by many operators with the curette.

The results obtained by the author were most excellent, and he thought as much of the benefit of the operation came from the removal of the tension on the circulation in the neighboring parts as from entering these cavities. In many of these cases probably the frontal sinus was involved, and when the author removed pressure from the venous return, the absorbent lymphatics and others took up the morbid product, thereby resulting in a cure of the parts that were apparently diseased.



Dr. A. LOGAN TURNER said he had had no experience with the operation described by the author of the paper, consequently he did not feel competent to discuss it. However, after the author's description of the operation, he congratulated him upon his success. When he got back to work he would certainly do the operation in the first case that was suitable. We ought to cure patients if we could, and he expressed the belief that this was possible; but what always seemed to him unpleasant was this large permanent opening between the nasal chamber and the antral chamber. He wondered whether the author could predict what the future of these patients would be in regard to taking colds, ordinary catarrh, whether there was risk of these patients getting their cold, as it were, in their opened up antra rather than in their nasal cavities.

Dr. CHARLES W. RICHARDSON said there was one point in the paper that was little understood, and that was with reference to packing for three or four weeks. The speaker had done the operation just as the author had described it, and he had found it difficult to keep the packing in. In a case he had recently the packing fell below the uvula. He did not know what method the author adopted for keeping the packing in place. Most patients invariably drew the packing down into the pharynx, and it was unpleasant to have to remove it. So he had given up packing in these cases. He would like to know how the author retained the packing.

Dr. BERENS, closing the discussion, in answer to Dr. Myles' criticism as to the use of the sharp curette, said that in his hands it was quite satisfactory. He could make as clean a wound with the curette in this region as he could in any mastoid operation. Shreds of tissue did not follow its use. He went either through the posterior ethmoid cell or through the natural opening of the sphenoid, as either happened to be the more convenient, and curetted downward and outward, and he had not had any trouble in using the large curettes in breaking down the anterior wall. He saved as much of the anterior wall external to the spheno-palatine foramina as possible. If he did not do this he might get a troublesome hemorrhage, and in spite of the utmost care one might get severe arterial hemorrhage from the spheno-palatine vessel, and this possibility was one of the strong points in favor of this operation, for one could readily control the hemorrhage in breaking down the anterior wall because of the large wound.

So far as not being able to remove all the ethmoid cells was concerned, one could take away the lateral masses, if he was careful in his technique.

All of the cases of tic he mentioned in his paper were those occurring in patients in whom there was no tension from confined pus. They were all cases that had previously been operated upon intra-nasally or through the canine fossa, one by himself and several by New York rhinologists. The sphenoid cells were open and were discharging pus freely; the ethmoids were discharging, also the antrum. An old lady, 72 years of age, on whom he operated, got an attack of tic every time she had pus in the sphenoid, and there was a hole as large as a quarter of a dollar in the sphenoid. Notwithstanding this, she got an attack of tic douloureux every time pus collected there.

In regard to Dr. Turner's question, he would say that in *Case 4*, the patient recently suffered from a severe coryza, with a mucopurulent discharge from both nostrils, but it caused much less trouble on the operated side and cleared up much more rapidly than on the affected side. This happened in three other cases.

In regard to packing, after he took out the packing inserted at the time of the operation, he did not repack. As to keeping the packing in, if Dr. Richardson would insert the packing well up into the sphenoid sinus, he would catch the upper end and prevent the lower part from falling behind the uvula.

(TO BE CONTINUED.)

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#### A CORRECTION.

Toledo, O., April 27, 1905.

Editor THE LARYNGOSCOPE,

Dear Doctor—My attention has been called to omissions of priority and credit in my article on Tracheal Injections by Dr. Baraton, Paris, and I request publication of the following corrections:

Professor Troussseau and Dr. Belloc in a treatise on Laryngeal Phthisis, published in 1837, recommended a syringe with long curved canula for injecting a spray of liquid medicament into the larynx thus apparently antedating Dr. Horace Green's experiments with tracheal probang and tube.

Bennett (Edinburgh Medical Journal, 1857) and Griesinger (Württemberg Korrespondenz Blatt, 1858) recommended bronchial injections in pulmonary maladies. Störck (Klinik des Krankheiten des Kehlkopf, Stuttgart, 1880) describes an instrument and method of intratracheal injections. Baraton, Paris, used liquid vaseline as a vehicle as early as 1889 (Progress Medical) and has consistently advocated its use in private practice and in clinic, thus placing his name among the earliest advocates of this method as used today.

Very truly,

THOMAS HUBBARD.

## BOOK REVIEWS.

**Die Krankheiten der Nase und des Nasenrachens.** Mit besonderer Berücksichtigung der rhinologischen Propädeutik. By Dr. CARL ZARNIKO, Hamburg. Second revised edition. Second part: Special Pathology and Therapy. With 161 illustrations and five plates; pages 490, octavo, paper bound. Publisher, S. Karger, Karlstrasse 13, Berlin, 1905. Price, Mk. 11, 20.

The concluding half of Zarniko's work appears three years after the introductory portion. It bears the same stamp of independence and originality, which was noticeable in the first. At the same time, very complete references are given to other authorities facilitating further investigation on the part of the reader.

Division I, in 14 chapters, on the nose and naso pharynx, presents very fully the etiology, diagnosis and therapy of the various deformities and affections of the nose and throat.

Division II, in 2 chapters, is devoted to the accessory Sinuses. The inflammations are first considered. The position of the German authorities on this important field of work is well presented. The author concludes with the chapter on Neoplasms of the Sinuses.

This volume is specially valuable for the specialist who appreciates an opportunity to compare the opinion of an author with those of his contemporaries and to select according to his own judgment. Zarniko states his own position with definiteness; but at the same time he clearly indicates the position of those who differ from him.

B.

**A Treatise on Diseases of the Nose and Throat.** By ERNEST L. SHURLY, M.D., Vice-President and Professor of Laryngology and Clinical Medicine, Detroit College of Medicine; Laryngologist and late Chief of Staff, Harper Hospital; Consulting Laryngologist and Chief of Laryngological Clinic of St. Mary's Hospital; Consulting Laryngologist to the Woman's Hospital and Foundlings' Home, Member of the American Laryngological Association, of the American Climatological Association, of the American Medical Association, of the Michigan State Medical Society, of the American Academy of Ophthalmology and Oto-Laryngology, etc. Second Edition, revised. Octavo, pp. xx-744, with 225 illustrations in the text and 6 plates in colors. Publisher, D. Appleton and Company, New York and London, 1905.

The second edition of this work maintains the standard set by the first as an invaluable reference book for the specialist and general practitioner alike. The author has not changed the plan of the work; but he has made such changes and additions as the progress of Laryngology and Rhinology demands. A number of new illustrations have been added, and some of the illustrations in the first addition have been replaced by more important ones.

The qualifications of the author, not only as an experienced laryngologist, but as a general practitioner of long standing, have been increased by the experience of the past five years, and the result is a presentation of these specialties along the broadest lines, even more successful, if possible, than in

the first edition. Those parts of the book dealing with the diseases of the upper respiratory track in their relation to the general system are specially valuable.

Those who have known the first edition will welcome the new volume. To those who have not, it is heartily recommended, because of its broad and clear conception of the special fields with which it is concerned.

B.

**Laryngeal Phthisis.** By RICHARD LAKE, F.R.C.S. Eng. Second Edition, Enlarged and Re-Written. By HAROLD BARWELL, M.D., Lond. F.R.C.S., Eng., Laryngologist, Mount Vernon Hospital for Consumption, etc.; Assistant Surgeon, Metropolitan Ear, Nose and Throat Hospital; Consulting Surgeon for Throat and Ear Diseases, Cripples' Home for Girls; Clinical Assistant to the Throat Department, St. George's Hospital. Half Octavo, pp. x+120, with 45 illustrations (20 colored). Publisher, Ballière, Tindall & Cox, 8, Henrietta St., Covent Garden, London. 1905. Price, 6s. 6d.

This monograph on one of the most important subjects in laryngology is presented by Mr. Barwell, who has undertaken the issuing of a second edition of Mr. Lake's work. Without departing from the concise and convenient form of the original volume, Mr. Barwell has produced a more complete treatise than the first edition aimed to be. Much of the matter has been re-written, all has been rearranged, and the recent additions to the knowledge of the subject have been included. The result is thoroughly satisfactory and up-to-date.

We would call attention to the chapters on diagnosis and treatment and the better prognosis which is claimed for this serious disease. The resources available for combatting laryngeal tuberculosis are presented very fully, including a chapter on the choice of treatment. Numerous valuable formulae are appended, the illustrations reproduce very clearly the various manifestations of the disease.

B.

**The Thyroid and Parathyroid Glands.** By HUBERT RICHARDSON, M.D., Pathologist to Maryland Asylum and Training School for Feeble-Minded Children; Demonstrator of Physiologic Chemistry, University of Maryland. One Vol., pages xiii+261, with 75 half-tone illustrations made from special drawings by F. P. Wightman. Publisher, P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia. 1905. Price, \$3.00 net.

A very valuable service has been done for the medical profession by the author of this volume. As far as we know, this is the first time that the results of the brilliant researches which have been carried out upon the Thyroid and Parathyroid glands have been included within the compass of one volume.

Dr. Richardson in the first chapter reviews the history of glandular therapeutics in general. In the three succeeding chapters the normal Embryology, Anatomy, Histology, Physiology and Chemistry of the Thyroid and Parathyroids are presented. The largest portion of the book is devoted to the various diseases associated with these organs. Surgical and Medical treatment are fully considered. The use of the Thyroid and its preparations as a therapeutic agent occupies an interesting chapter.

The illustrations are excellent. The appendix contains a complete bibliography of articles published since 1900. The author is to be congratulated on having made this first comprehensive book on the subject so eminently satisfactory.

B.

